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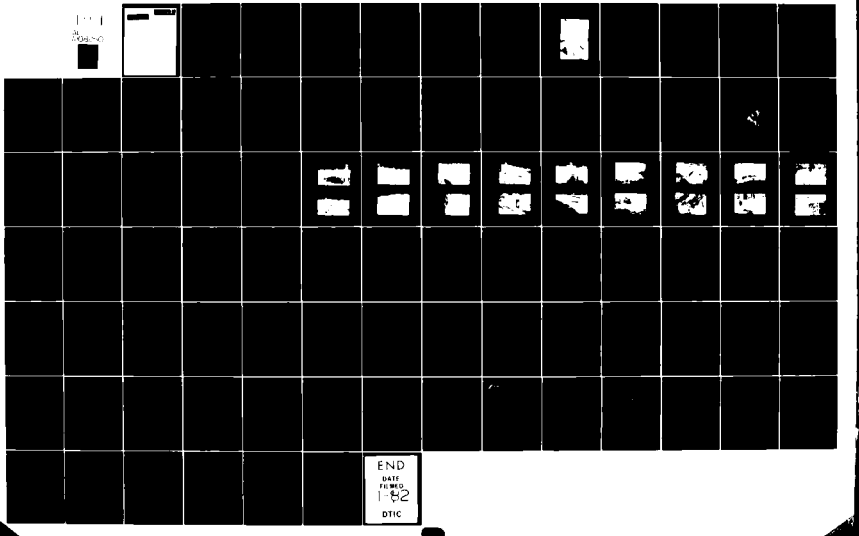

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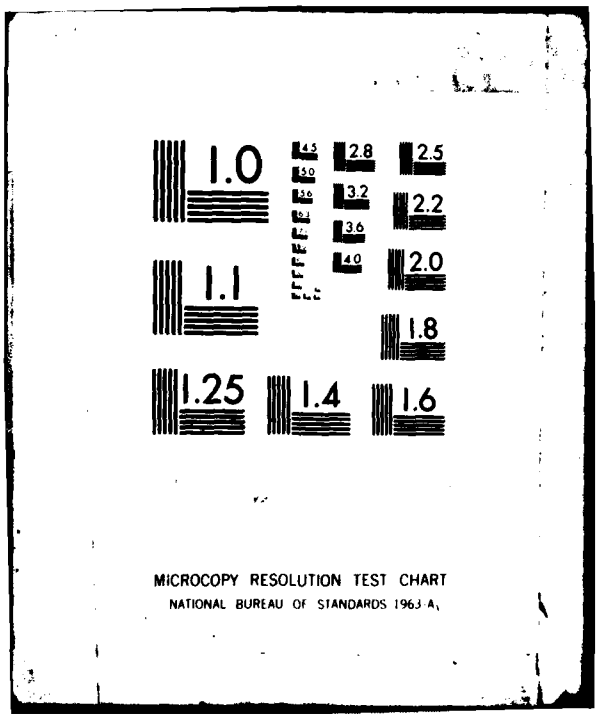
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A108250	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) National Program of Inspection of Non-Federal Dams, Tennessee. Chancellor & Son Dam (Inventory Number TN 06939) near Saulsbury , TN., Hardeman County, TN., Hatchie River Basin		5. TYPE OF REPORT & PERIOD COVERED Phase 1 Investigation Report 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s) DACW-62-81-C-0056
9. PERFORMING ORGANIZATION NAME AND ADDRESS Tennessee Department of Conservation Division of Water Resources 4721 Trousdale Dr., Nashville, TN 37220		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Engineer District, Nashville P.O. Box 1070 Nashville, TN 37202		12. REPORT DATE September, 1981 13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams
Dam Safety
National Dam Safety Program
Chancellor & Son Dam, TN
Saulsbury, TN
Hardeman County, TN
Embankments
Visual Inspection
Structural Analysis

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Report is based on the findings of a Phase I inspection of Chancellor and Son Dam in Hardeman County. The earthfillembankment is 24 feet high and 550 feet long with a crest width of 15 feet. The service spillway is a 36 inch concrete culvert passing through the embankment near the crest. The drawdown drain is a 10 inch corrugated metal pipe with a slide gate at the inlet and a plug in the outlet. The emergency spillway is a triangular earth channel at the left end of the dam. The maximum depth of the spillway is 2.7 feet and the top width is 114.5 feet. The right side of the spillway is formed by fill material. The

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dam is in the small size high hazard potential category. The stability of the embankment is questionable due to the prominent phreatic surface and the sandy fill. Also, the lack of cover on the slopes is allowing erosion. A 2-3 gpm flow is emerging at the toe of the embankment. The available data is insufficient to assess the potential affect of the seepage on the embankment. The reservoir has a sufficient storage/spillway capacity to pass the PMF, but the embankment portion of the emergency spillway would probably deteriorate rapidly under high stage flows. Also, the service spillway is not properly designed to pass large flows. The spillways are therefore considered to be seriously inadequate. Chancellor and Son Dam is considered tohhave a condition classification of "unsafe nonemergency".

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202

ORNED-G IN REPLY REFER TO

21 SEP 1981

Honorable Lamar Alexander
Governor of Tennessee
Nashville, TN 37219

Dear Governor Alexander:

Furnished herewith is the Phase I Investigation Report on Chancellor and Son Dam near Saulsbury, Tennessee. The report was prepared under the authority and provisions of PL 92-367, the National Dam Inspection Act, dated 8 August 1972.

The report presents details of the field inspection, background information, technical analyses, findings, and recommendations for improving the condition of the dam.

Based upon the inspection and subsequent evaluation, Chancellor and Son Dam is classified as unsafe-nonemergency due to excessive seepage through the embankment, and a spillway configuration which would allow a rapid deterioration of the embankment during high flows.

The recommendation concerning project modifications to allow safe passage of the design flood and others contained in this report should be undertaken in the near future to minimize the risk of a failure and possible loss of life and property below the dam.

Public release of the report and initiation of public statements fall within your prerogative. However, under provisions of the Freedom of Information Act, the Corps of Engineers is required to respond fully to inquiries on information contained in the report and to make it accessible for review on request.

Your assistance in keeping me informed of any further developments will be appreciated.

Sincerely,

Kenneth W. Oakley, etc
FOR LEE W. TUCKER
Colonel, Corps of Engineers
Commander

1 Incl
As stated

CF:
Mr. Robert A. Hunt, Director
Division of Water Resources
4721 Trousdale Drive
Nashville, TN 37220

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
TENNESSEE

Name of Dam ..... Chancellor and Son

County ..... Hardeman

Stream ..... Unnamed trib. of Spring Creek

Date of Inspection ..... March 10, 1981

This investigation and evaluation was prepared by the Tennessee Department of Conservation, Division of Water Resources.

Prepared By:

George E. Moore
Regional Engineer

Approved By:

Edmond O'Neill
Chief Engineer
Safe Dams Section

Approved By:

Robert A. Hunt, P.E.
Director, Division of
Water Resources
Tennessee Department
of Conservation

PREFACE

This report is prepared under guidance contained in the Department of the Army, Office of the Chief of Engineers, Recommended Guidelines for Safety Inspection of Dams, for a Phase I investigation. The purpose of the Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In the review of this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. Additional data or data furnished containing incorrect information could alter the findings of this report. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structures and may obscure certain conditions which might be detectable if inspected under the normal operating environment of the structure.

The analyses and recommendations included in this report are related to the hazard classification of the structure at the time of the report. Changes in conditions downstream of the dam may change the hazard classification of the structure. A change in hazard classification may in turn change the design flood on which the hydraulic and hydrologic analyses are based and may have a significant impact on the assessment of the safety of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present conditions of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspections can there be any chance that unsafe conditions will be detected.

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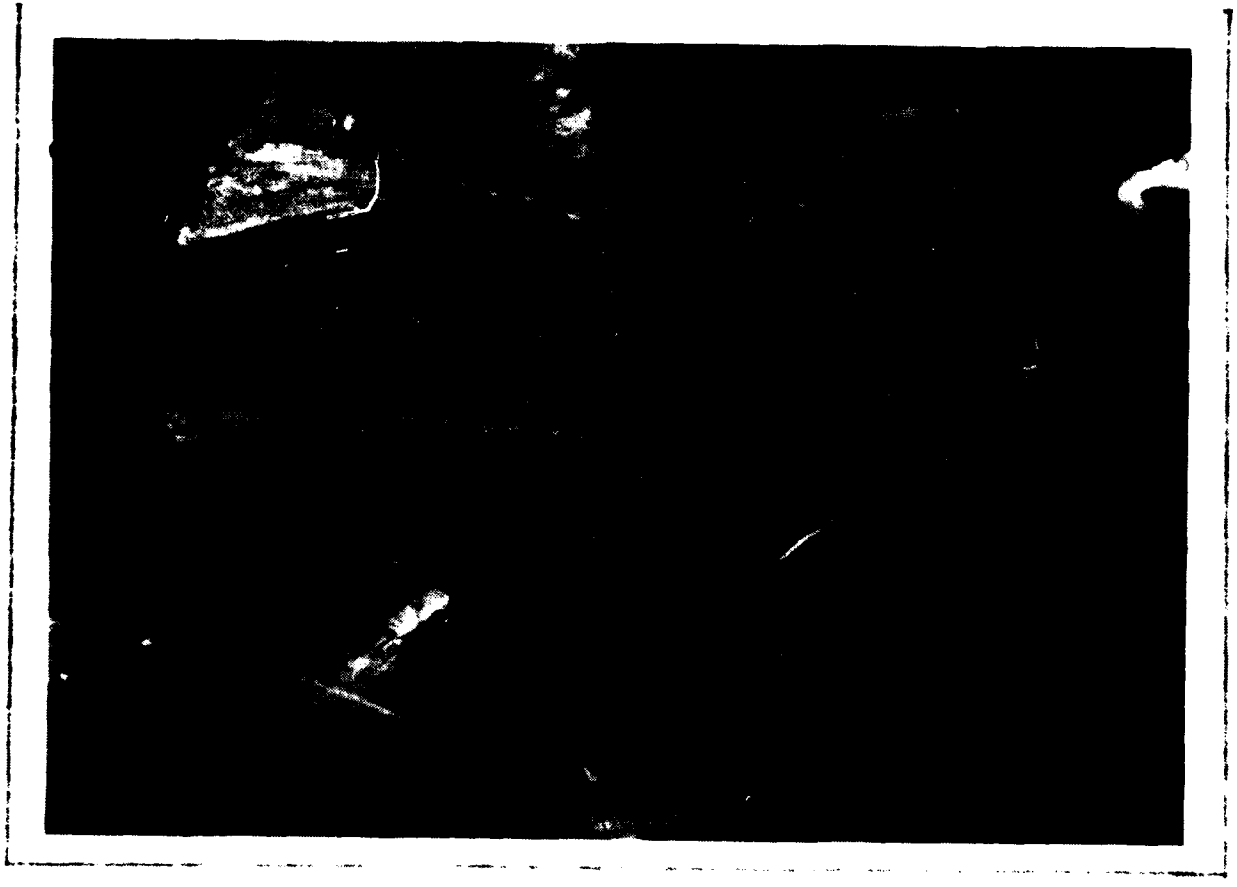


OVERVIEW PHOTOGRAPH

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam ..... Chancellor and Son

County ..... Hardeman

Stream ..... Unnamed Trib. of Spring Creek

Date of Inspection ..... March 10, 1981

ABSTRACT

This report is based on the findings of a Phase I inspection of Chancellor and Son Dam in Hardeman County. The earthfill embankment is 24 feet high and 550 feet long with a crest width of 15 feet. The service spillway is a 36 inch concrete culvert passing through the embankment near the crest. The drawdown drain is a 10 inch corrugated metal pipe with a slide gate at the inlet and a plug in the outlet. The emergency spillway is a triangular earth channel at the left end of the dam. The maximum depth of the spillway is 2.7 feet and the top width is 114.5 feet. The right side of the spillway is formed by fill material. The dam is in the small size, high hazard potential category. The stability of the embankment is questionable due to the prominent phreatic surface and the sandy fill. Also, the lack of cover on the slopes is allowing erosion. A 2-3 gpm flow is emerging at the toe of the embankment. The available data is insufficient to assess the potential affect of the seepage on the embankment. The reservoir has sufficient storage/spillway capacity to pass the PMF, but the embankment portion of the emergency spillway would probably deteriorate rapidly under high stage flows. Also, the service spillway is not properly designed to pass large flows. The spillways are therefore considered to be seriously inadequate. Because of these findings, Chancellor and Son Dam is considered to have a condition classification of "unsafe nonemergency".

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
CHANCELLOR AND SON DAM
HARDEMAN COUNTY, TENNESSEE

SECTION 1 - GENERAL

1.1 Authority - The Phase I inspection of this dam was carried out under the authority of Tennessee Code Annotated, Sections 70-2501 to 70-2530, The Safe Dams Act of 1973, and in cooperation with the U. S. Army Corps of Engineers under the authority of Public Law 92-367, The National Dam Inspection Act.

1.2 Purpose and Scope - The purpose of a Phase I investigation is to develop an engineering assessment of the general condition of a dam with respect to safety and stability. This is accomplished by conducting a visual inspection, reviewing any available design and construction data, and performing appropriate hydraulic, hydrologic, and other analyses. A comprehensive description of the Phase I investigation program is given in Recommended Guidelines for Safety Inspection of Dams, Department of the Army, Chief of Engineers, Washington, D. C. 20314.

1.3 Past Inspections - Past inspections of Chancellor and Son Dam include a cursory inspection by George Moore of the Tennessee Division of Water Resources on February 6, 1978. At this time, the generally poor construction of the dam was noted. A preliminary site review was made February 16, 1977, by Ed O'Neill of the Division of Water Resources. After this inspection, the owners were advised that engineering studies were needed and that the stringent criteria of the high hazard category should be met.

1.4 Miscellaneous Details - The day of the inspection was clear with light breezes and an ambient temperature of about 60°F. The pool elevation was 571.2 feet msl, 7.5 feet below the effective crest of the dam.

1.5 Inspection Team Members - The inspection was conducted by the following State personnel:

Ed O'Neill, Chief Engineer
George Moore, Regional Engineer
Bill Culbert, Water Resources Engineer
Anthony Privett, Engineering Co-op

SECTION 2 - PROJECT DESCRIPTION

2.1 Location - The project is located in Hardeman County, Tennessee, about 4 miles east of Saulsbury, Tennessee. The dam is located on the Saulsbury topographic quadrangle at 89°01'06" west longitude and 35°02'05" north latitude. Location maps are provided in Appendix B of this report. The dam intercepts an unnamed tributary of the east fork of Spring Creek approximately 1000' upstream of Spring Lake (TN06930) in the Candlewood Lakes Subdivision. The dam is located about 1.4 miles from the tributary's confluence with the east fork of Spring Creek and 5.8 miles from the east fork's confluence with several streams to form the mainstem of Spring Creek.

2.2 Description

2.2.1 Embankment - The dam is an earth embankment structure 24' high (crest elevation 578.7' msl). The crest is 15' wide and 550' long. The embankment is roughly "s" shaped turning upstream on the left end and downstream on the right. The crest is sloped upstream. The downstream slope is 1V:2.3H flattening to 1V:5.9H near the toe. The upstream slope is 1V:2.4H. A 6" perforated pipe foundation drain is installed in the downstream toe and discharges at the right side of the service spillway chute. The dam site is located in the Claiborne and Wilcox formations of the Mississippi Embayment sediments. These are irregularly bedded sands of the Tertiary Period locally interbedded with lenses and beds of gray and white clays, silty clays, lignitic clay, and lignite. Sketches are provided in Appendix B.

2.2.2 Service Spillway - The service spillway is a 36" ID concrete pipe passing through the embankment near the crest (inlet elevation 575.3' msl). Concrete headwalls exist at both the inlet and outlet of the pipe.

The flow from the outlet drops about 8 inches into a 30" x 6" triangular concrete chute. The chute has a 28% slope for about 26 feet and then increases to 43.2% and continues to the toe. The chute turns about 30° to the right at the break in the slope. Both transitions are abrupt. There are no energy dissipators. Maximum flow through the pipe is estimated to be 49 cfs.

2.2.3 Emergency Spillway - The emergency spillway is a triangular earth channel on the left abutment. The left side of the spillway is cut into natural ground in the abutment and has a slope of 1V:10.6H. The right side of the spillway is formed by the fill material of the embankment and has a slope of 1V:1.8H. The fill material drops off at a relatively steep angle for a short distance to natural ground. The crest of the spillway is 2.7 feet below the top of the dam. The maximum discharge of the spillway is about 715 cfs.

2.2.4 Drawdown Drain - The drawdown drain is a 10" ID corrugated metal pipe with a slide gate on the inlet and a plug in the outlet. According to the owner, the pipe can drain about 2/3 of the lake. The outlet of the pipe is located immediately to the right of the service spillway chute and about 5 feet above the toe.

2.2.5 Reservoir and Drainage Area - The reservoir has a normal area of about 6 acres with a fetch of 600 feet. The normal impounding capacity of the lake is about 52 acre-feet with 21 acre-feet of storage above normal pool. The drainage area is about 40 acres and the predominant soils are Ruston, Lexington, and Providence. The watershed land uses are meadows, residential lots, and woods.

2.2.6 Miscellaneous - The dam is owned by Buck Chancellor, Sr. The dam was built in 1978 as a private recreational lake. The construction was performed by Chancellor and Son Construction Company. Harry Fulton & Associates, Inc. reportedly developed plans for a dam near the specified site. The plans are unlabeled and unsigned and the dam is not built according to the plans. Spigolon Disc was hired as a soils engineer; however, the soils tests were limited to compaction tests on the embankment material. No record of test boring prior to construction were found. No instrumentation was found on the dam.

SECTION 3 - INSPECTION FINDINGS

3.1 Specific Findings

3.1.1 A flow of about 2-3 gpm is emerging from the area around the end of the service spillway chute and the left embankment abutment contact (photos 11-13, sketch p. 1 of 4). The owner reported that a spring was located in this area prior to construction of the dam. The water has been discolored by FeO_2. There is no clear evidence indicating that the water is transporting embankment material due to the erosion deposits in the area from the abutments. About 1 gpm is emerging around the exterior of the toe drain outlets. No distinct sources could be pinpointed for the remainder of the flow.

The lower 1/4 of the dam is saturated but little or no flow was seen except in the area mentioned above. The upper edge of the saturated portion of the slope forms a fairly distinct line along the slope (photo no. 4). The line has formed within a few feet of the water surface elevation.

The water level in the reservoir has never been appreciably higher than on the day of the inspection. The owner reported that the water level has never reached the inlet of the service spillway.

3.1.2 A hand auger sample from the crest of the dam is a silty sand of group SC in the Unified Classification System. A mechanical analysis of the sample indicated a sand content of 76.6% with the remaining 23.5% fines. The sample is from a shallow depth at one location and is not necessarily indicative of the overall composition of the dam.

3.1.3 The grass cover on the downstream slope ranges from almost bare soil at the toe to a relatively dense stand near the crest. Two short rows of pine trees have been planted parallel to and slightly below the crest on the downstream slope (photo nos. 2-4). The upstream slope is almost bare (photo no. 1). The lack of vegetation has allowed erosion to occur. Gullies, which cover extensive areas of the slopes, are generally less than 1 foot deep (photo nos. 1, 4, 5, & 6).

3.1.4 The right side of the emergency spillway control section is formed by embankment fill material. The fill has a narrow crest (15') and would probably erode rapidly under high stage flows (photo no. 15).

3.1.5 The service spillway is a concrete culvert pipe passing through the embankment above the water level at the time of the inspection. The pipe joint was open about 1 inch. The pipe has a headwall on each end. Fill does not completely cover the pipe. Flow from the pipe drops into a small concrete chute. The maximum capacity of the chute is less than 3 cfs while the maximum capacity of the pipe is about 48 cfs. The flow will, therefore, overflow the chute and impinge upon the embankment (photo nos. 7-11).

3.1.6 According to OCE guidelines, the dam is in the small size and high hazard potential classifications. As such, the structure is required to pass the one-half to the full probable maximum flood (PMF). The volume of inflow during the PMF is 83.7 acre-feet. Analysis indicates that the structure can pass the AMC II PMF with no freeboard. Routing of the 100-year storm produced flow of .9 feet in the emergency spillway and the ½ PMF produced about 1.9 feet of flow in the emergency spillway.

3.1.7 The project is located in Seismic Zone 2.

3.1.8 This dam is in the high hazard potential classification as outlined in the OCE guidelines. Failure of the dam could affect two house trailers and Spring and Old Hickory Dams which are also considered high hazard. During the ½ PMF, Spring Lake Dam would be expected to fail but the storm will be contained by Old Hickory Dam. However, an excessive loading of silt and debris would occur.

3.1.9 The measured configuration of the dam differs markedly from the design plans. The longitudinal alignment of the dam has been changed from linear to sinusoidal. Plans call for 1V:3H side slopes but the measured slopes are 1V:2.4H upstream and 1V:2.3H downstream. The designed emergency spillway is a trapezoidal channel cut

into natural ground. The emergency spillway is instead a triangular channel partially based on fill material. The service spillway was designed to be a skirted concrete riser leading to a 15" class II concrete conduit with a slidegate at the base of the riser serving as a drawdown drain. The dam has a 10" corrugated metal pipe for a drawdown drain and a 36" concrete culvert, which passes through the dam at an elevation of 575.3', for a service spillway.

3.2 Conclusions and Recommendations

3.2.1 Conclusions

a. A significant amount of seepage or spring flow is coming from the embankment; however, an assessment of the potential effect of the flow on the dam could not be made based on the available data.

b. The phreatic line appears excessively high considering the impoundment water level and recent construction date.

c. The spillway configuration will allow passage of the PMF (AMC II). Slight overtopping will occur during the PMF under AMC III conditions. The current configuration of the spillways may allow a rapid deterioration of the embankment during high flows. The spillways are, therefore, considered to be seriously inadequate.

d. The seismic resistance of this structure is unknown, but, under this program, dams in Seismic Zone 2 may be assumed adequate under seismic loads provided static stability requirements are met. However, the high sand content of the fill and the high phreatic surface make the structural stability of the dam questionable.

e Erosion on the slopes is not a serious problem at this time; however, the sparse vegetative cover on the dam offers little protection against further deterioration by erosion.

f. Chancellor and Son Dam is considered to have a condition classification of "unsafe nonemergency".

3.2.2 Recommendations

a. A qualified engineer should be engaged to:

   1) Conduct stability analysis of the embankment and make recommendations for improvement as necessary.

   2) Investigate the flow at the toe of the dam and recommend appropriate action.

   3) Redesign and rebuild both spillways to provide safe passage of the ½PMF.

b. All pine trees should be removed and all erosion should be repaired. A soil binding grass cover should be established and maintained on all areas of the dam.

c. A program of regular inspection and routine maintenance should be established.

d. An emergency action plan should be developed to alert downstream residents in the event of any potentially hazardous situations.

SECTION 4 REVIEW BOARD FINDINGS

The Interagency Review Board for the National Program of Inspection of Non-Federal Dams met in Nashville on 9 July 1981 to examine the technical data contained in the Phase I investigation report on Chancellor and Son Dam. The Review Board considered the information and recommended that (1) the report should state that the dam does overtop slightly under the PMF, (2) the spillways should be both redesigned and rebuilt, and (3) the report should emphasize that the erosion on the embankment should be held in check. They agreed with other report conclusions and recommendations. A copy of the letter report presented by the Review Board is included in Appendix F.

APPENDIX A

DATA SUMMARY

APPENDIX A
DATA SUMMARY

A.1 Dam

A.1.1 Type - An "S" shaped earthfill dam with a concrete culvert service spillway, a corrugated metal drawdown drain, and a triangular earth channel emergency spillway.

A.1.2 Dimensions and Elevations - (Elevations referenced to TBM elevation 516.14 in pine tree on right abutment of Old Hickory Dam.)

a. Crest length - 550'
b. Crest width - 15'
c. Height - 24'
d. Crest elevation - 578.7' msl
e. Service spillway elevation - 575.3' msl
f. Emergency spillway elevation - 576.0' msl
g. Embankment slope, U/S - 1V:2.4H
h. Embankment slope, D/S - 1V:2.3H
i. Size classification - Small

A.1.2.1 Cutoff Trench - (as per owner)

a. Depth - 8-10'
b. Width - 10'

A.1.3 Zones and Grout Curtains - None

A.1.4 Instrumentation - None

A.2 Reservoir and Drainage Area

A.2.1 Reservoir - (Intended normal pool elevation of 575.3' msl has never been attained.)

a. Surface area - 3.8 acres
b. Fetch - 500'
c. Capacity (normal) - 32.8 acre-feet
d. Capacity (top of dam) - 46.4 acre-feet

A.2.2 Drainage Area

a. Size - 40 acres
b. Maximum relief - 85'
c. Soil - Ruston (HSG B), Lexington (HSG B), Providence (HSG C)

d. Cover - Woods, (40%), homestead/lawn (50%), water (10%)
e. Runoff (PMF) - 83.7 acre-feet
f. Runoff (P_{100}) - 12.7 acre-feet

A.3 Outlet Structures

A.3.1 Drawdown Drain - 10" CMP with slide gate at inlet.

A.3.2 Service Spillway - (Concrete pipe passing through embankment above current water level with a parabolic concrete chute passing down the slope.)

a. Pipe diameter - 36"
b. Pipe length - 49'
c. Pipe slope - 3.8%
d. Pipe capacity - 49 cfs
e. Chute top width - 2.5'
f. Chute depth - 6"
g. Chute slope, upper section - 28%
h. Chute slope, lower section - 43%
i. Chute capacity - 4 cfs

A.3.3 Emergency Spillway - (Triangular earth saddle on the left end of the dam.)

a. Left side slope - 1V:10.6H
b. Right side slope - 1V:41.8H
c. Maximum head - 2.7'
d. Capacity - 715 cfs

A.4 Historical Data

A.4.1 Construction Date - 1978

A.4.2 Designer - Reportedly Harry Fulton & Assc. Memphis, TN (Plans unlabeled and unsigned; dam not built according to plans)

A.4.3 Soils Testing - Spigolon Disc Memphis, Tennessee

A.4.4 Builder - Chancellor & Son Construction Co. Memphis, Tennessee

A.4.5 Owner - Jimmy Chancellor, Sr.
Chancellor & Son Const. Co.
7474 Raleigh LaGrange Rd.
Cordova, TN 38018

A.4.6 Previous Inspection - February 1978

A.4.7 Seismic Zone - 2

A.5 Downstream Hazard Data

A.5.1 Downstream Hazard Potential Classification

a. Corps of Engineers - High
b. State of Tennessee - 1

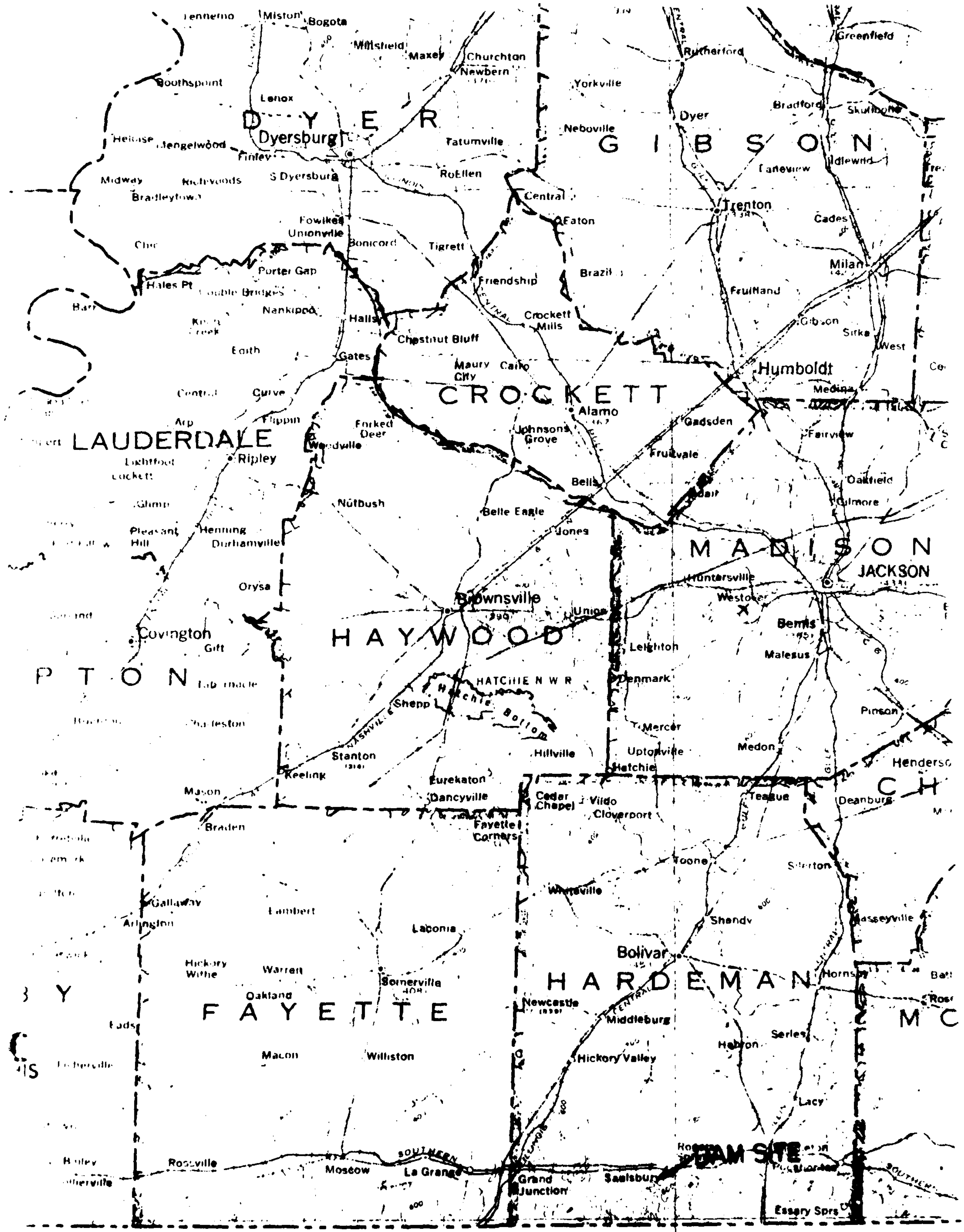
A.5.2 Persons in Probable Flood Path - 3+

A.5.3 Downstream Property - 2 housetrailers and at least one undeveloped residential lot; Spring Lake and Old Hickory Lake Dams which are also considered high hazard.

A.5.4 Warning Systems - None

APPENDIX B

SKETCHES AND LOCATION MAPS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Nankipoo
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Yorkville
Neboville
Dyer
Bradford
Greenfield
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Crockett Mills
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Cairo
Alamo
Johnsons Grove
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Fruitvale
Fairview
Oakfield
Gilmore
LAUDERDALE
Ripley
Curve
Flippin
Woodville
Nutbush
Belle Eagle
Jones
Henning
Durhamville
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Covington
Gift
MADISON
JACKSON
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Hillville
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Dancyville
Mason
Braden
Fayette Corners
Cedar Chapel
Vildo
Cloverport
Teague
Deanburg
Toone
Silerton
Whiteville
Shandy
Masseyville
Bolivar
Hornsby
HARDEMAN
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Hickory Valley
Hebron
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Gallaway
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Pocahontas
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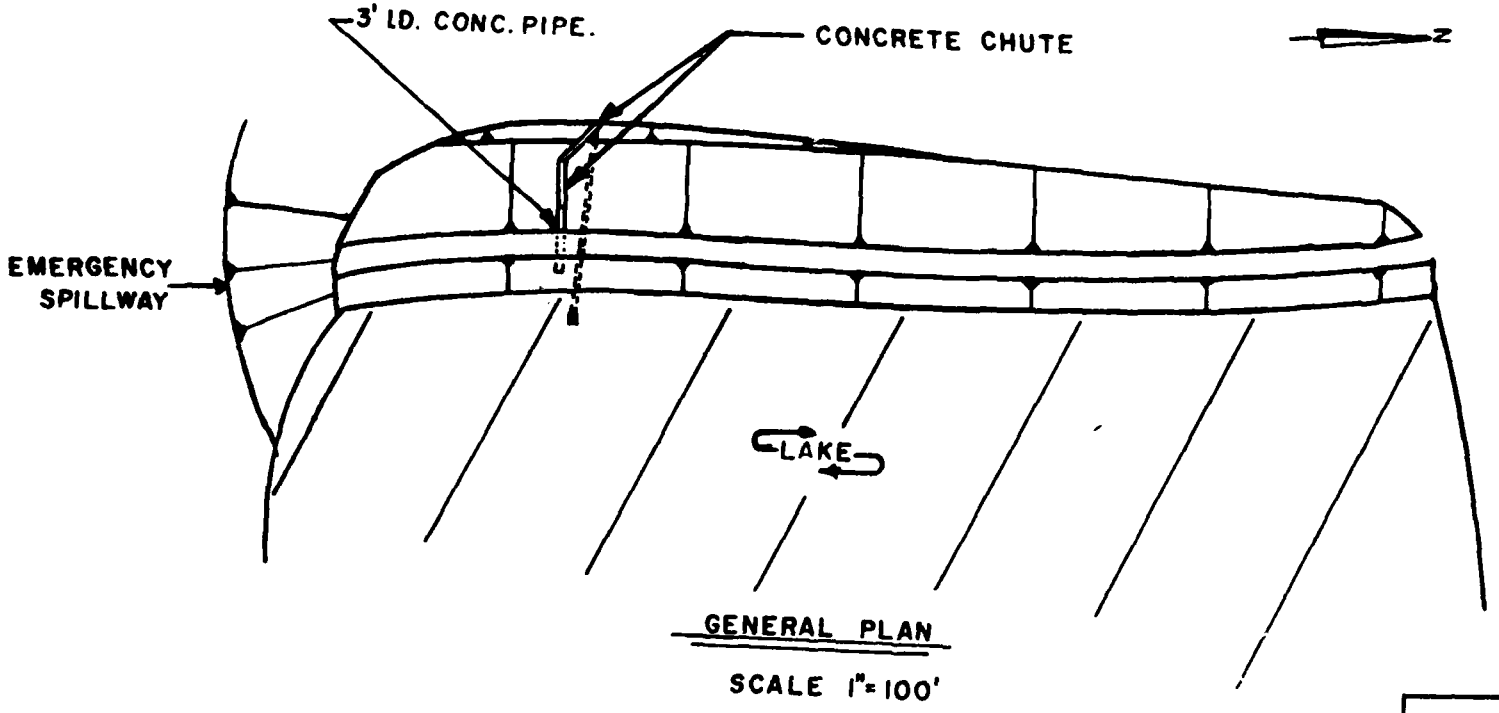
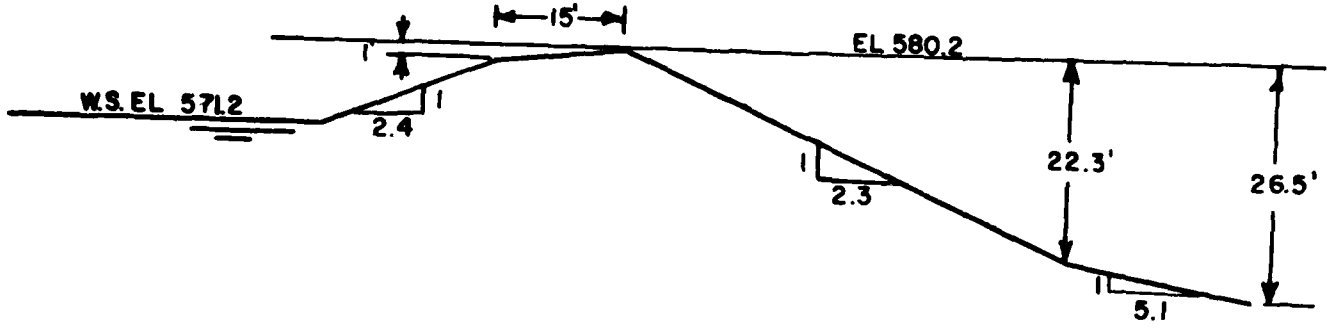
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL



GENERAL PLAN

SCALE 1"=100'

CHANCELLOR DAM
DRAWN BY ADP
DATE 7/2/81
SHEET 1 OF 4



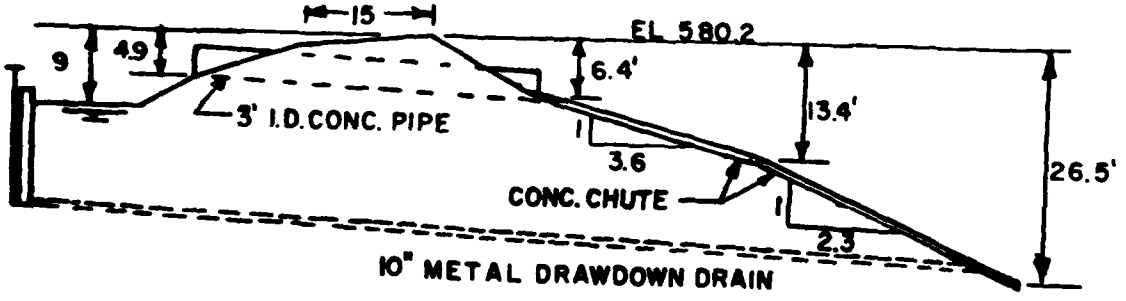
NOTE: ELEVATIONS REFERENCED TO 516.14 MSL BENCHMARK FOUND ON OLD HICKORY LAKE.

MAXIMUM SECTION

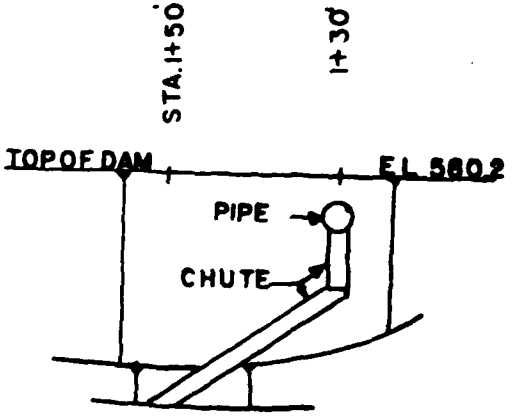
SCALE 1"=20'

STA. 1+80

CHANCELLOR DAM	
DRAWN BY	ADP
DATE	7/2/81
SHEET	2 OF 4



SECTIONAL VIEW

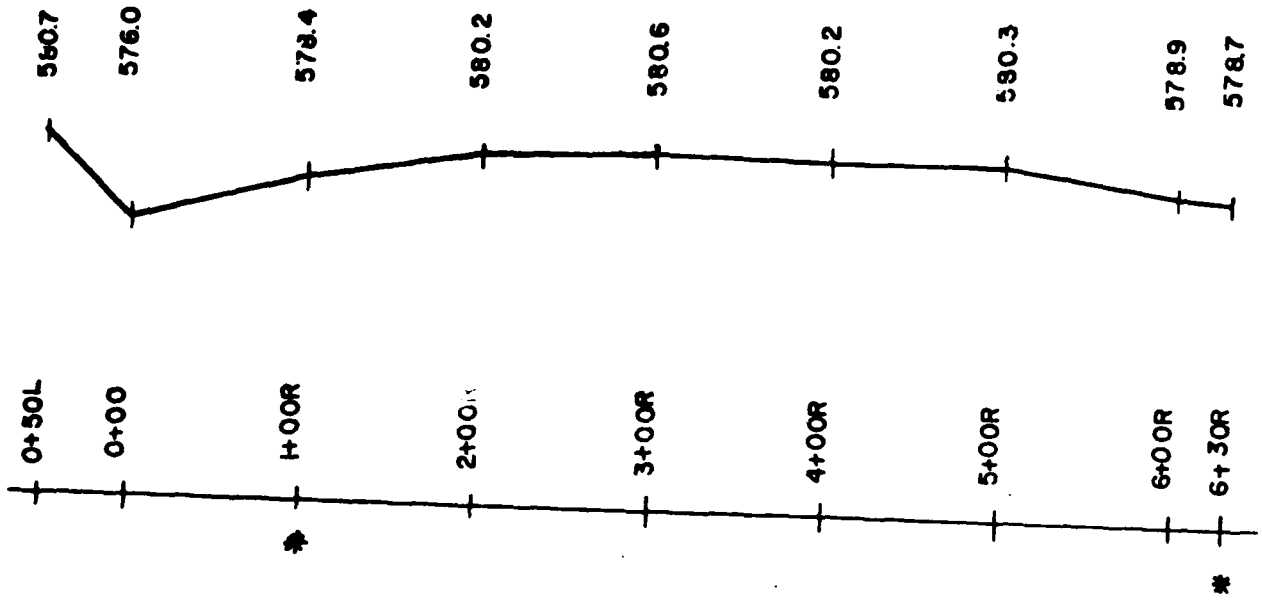


DOWNSTREAM FACE VEIW

SPILLWAY PROFILE

SCALE 1"=20'

CHANCELLOR DAM
DRAWN BY ADP
DATE 7/2/81
SHEET 3 OF 4



CREST ℄ PROFILE

H. SCALE 1" = 100'
V. SCALE 1" = 10'

CHANCELLOR DAM
DRAWN BY ADP
DATE 7/2/81
SHEET 4 OF 4

APPENDIX C

PHOTOGRAPHIC RECORD

PHOTOGRAPHIC LOG

Photo No. 1 - The upstream slope of the dam from the left abutment.

Photo No. 2 - The crest of the dam from above the service spillway. (Note pine saplings just below crest on downstream slope.)

Photo No. 3 - The downstream slope of the dam from the toe.

Photo No. 4 - The downstream slope. (Note the transition from dry to wet about 1/2 to 2/3 down the slope.)

Photo Nos. 5 & 6 - Erosion gullies forming on the downstream slope.

Photo No. 7 - The inlet to the service spillway. The wooden stick in the gully below the inlet marks the highest recorded water level in the reservoir.

Photo No. 8 - The outlet of the service spillway. (Note the lack of fill over the pipe behind the headwall.)

Photo No. 9 - The outlet of the service spillway and the chute leading down the slope. (Note concrete plug in invert of pipe.)

Photo No. 10 - A crack running across the service spillway chute just below the outlet headwall.

Photo No. 11 - The area below the toe from the upper portion of the service spillway chute. (Note wetland vegetation and generally wet conditions.)

Photo Nos. 12 & 13 - The seepage area at the toe at the base of the service spillway chute.

Photo No. 14 - The toe drain outlet. A large portion of the flow appears to be coming around the pipe.

Photo No. 15 - The left end of the dam and emergency spillway.

Photo No. 16 - The downstream slope of the dam from the road below the dam. The trailer on the left is the most obviously endangered structure below the dam.

Photo Nos. 17 & 18 - Two small basins built in the upper part of the reservoir.

PHOTO NO. 1

PHOTO NO. 2

PHOTO NO. 3

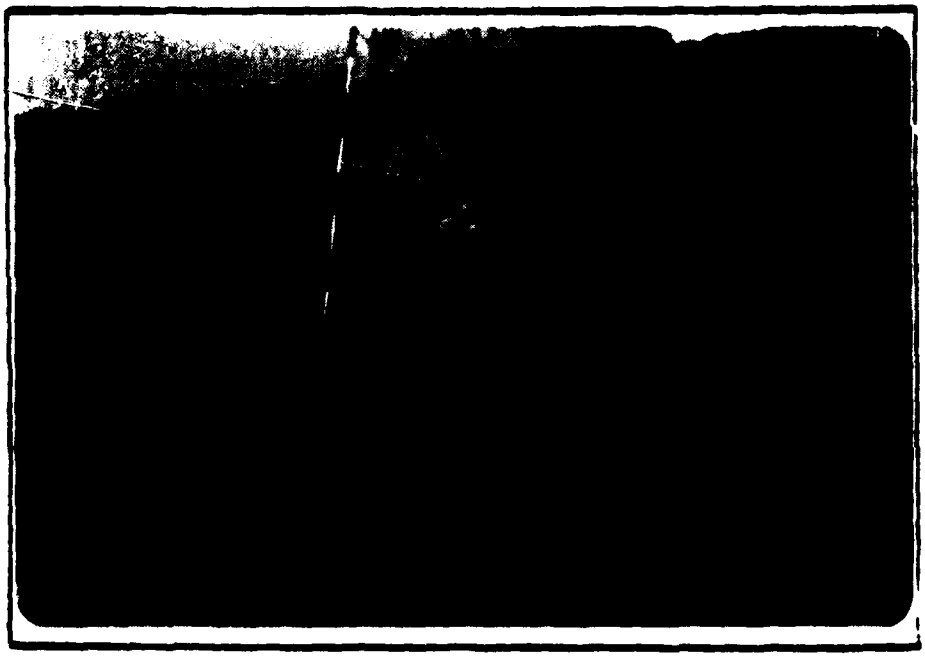


PHOTO NO. 4

PHOTO NO. 5

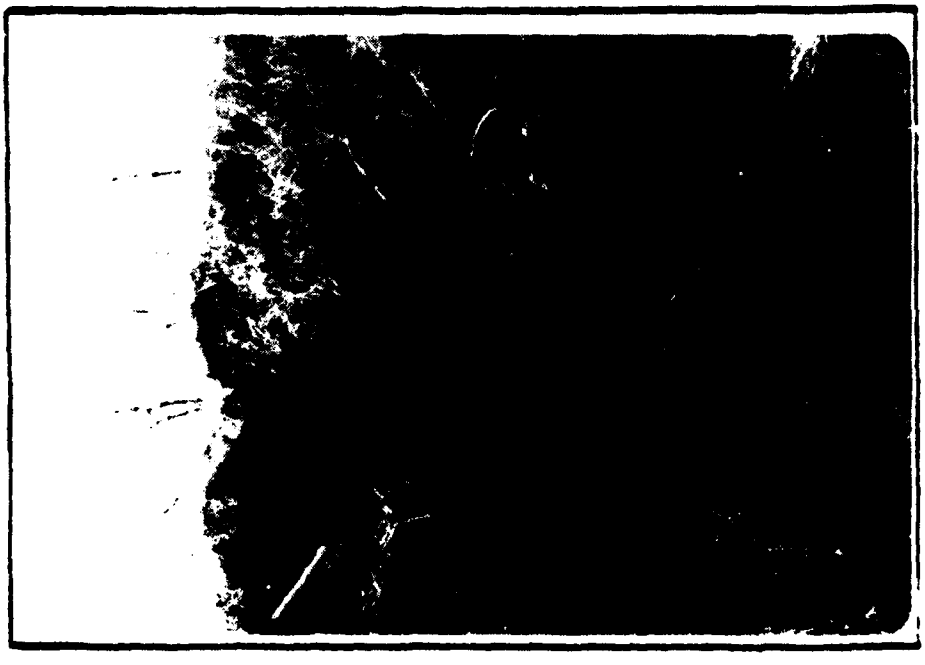


PHOTO NO. 6

PHOTO NO. 7

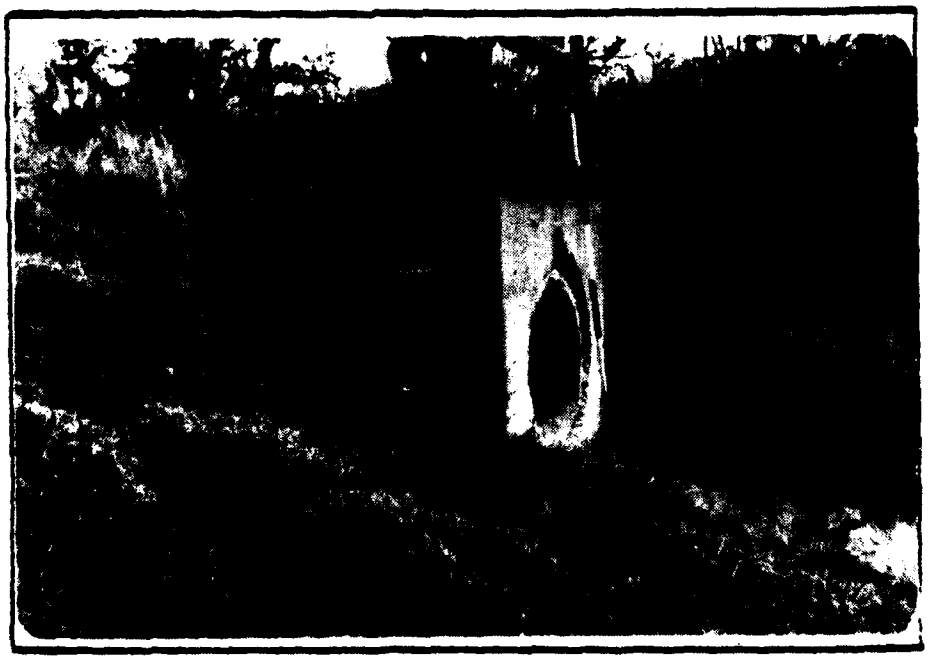


PHOTO NO. 8

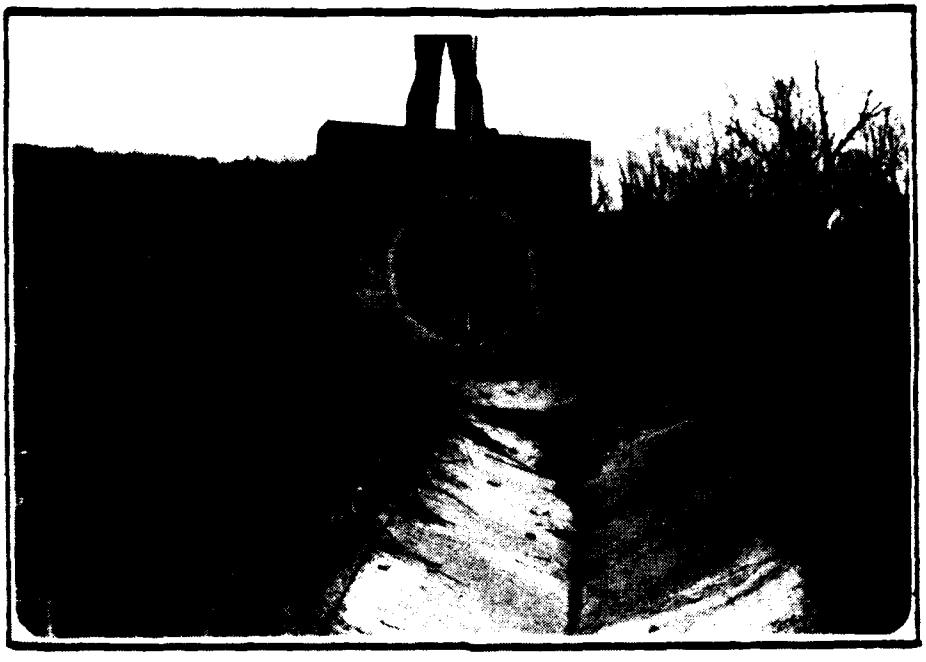


PHOTO NO. 9

PHOTO NO. 10

PHOTO NO. 11

PHOTO NO. 12

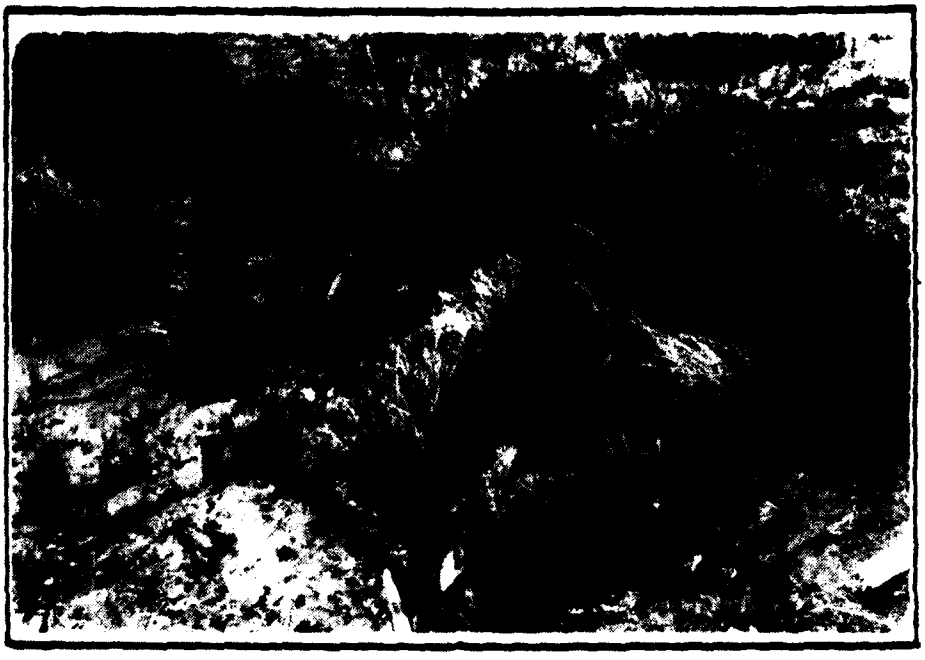


PHOTO NO. 13

PHOTO NO. 14

PHOTO NO. 15

PHOTO NO. 16

PHOTO NO. 17

PHOTO NO. 18

APPENDIX D

CHECKLISTS - VISUAL INSPECTION, ENGINEERING DATA, SOIL TESTS

Trip Report - Chancellor Dam
Hardeman County
March 10, 1981

General

This dam is believed to have been built in the spring of 1978. It is owned by Chancellor & Sons Construction Company. No design plans were submitted to the State for approval and no Certificate of Approval and Safety was issued. The dam was discovered during a Phase I aerial photography mission in May of 1978. An on-ground reconnaissance revealed a dam with the embankment finished and the principle spillway partially complete. Chancellor & Sons is an earth work contracting firm which has a capability of building dams such as this. They have built several good dams in the past. This dam does not appear to have the quality of workmanship as other dams which they have built. The dam has never been filled to the service spillway due to dry weather and probably leakage through sand layers.

Findings

The dam is built of a red sandy clay which is highly erodable and has a high sand content. Side slopes of the dam appear to be too steep to be maintained by tractor and rotary mower. Two rows of pine trees are planted at the downstream edge of the crest. There is a large flow (1 to 2 gpm) coming from and around a corrugated pipe located just to the right of the principle spillway chute. Mr. Chancellor, who was present at the inspection, says that the flow is

from a spring and is not coming through the dam. No cracks, slides, or seepage, except as described, were found.

The service spillway is a 36" concrete culvert pipe through the upper portion of the dam. The pipe has one joint with about 1" space in the joint. The pipe was crawled through by Anthony Privett. There is a chute type spillway leading from the culvert to the downstream toe of the dam. This chute does not appear adequate to carry the pipe flow. The assumed emergency spillway which appears as just a low area in the dam is toward the left abutment of the dam. There is not enough bulk in the spillway and it would not hold up under a sustained flow.

The phreatic line appears to be surfacing about 1/3 of the way up the slope. This would coincide approximately with the water level on the day of inspection. There is some erosion on the downstream slope of the dam and the entire slope needs regrassing. Mr. Chancellor states that he got compaction tests during construction through Spigolon and that Harry Fulton, an engineer in Memphis, provided plans. He stated that S. J. Spigolon was to have gotten a Certificate of Approval and Safety and it was their opinion at the time of construction that he did obtain one.

Conclusions

The dam does not have the appearance of being well constructed or well engineered. It is in the high hazard potential category due to the recreation subdivision lots and a mobile home located just below the dam.

Recommendations

A qualified engineer should be engaged to evaluate the overall condition of the dam. The evaluation should include, but not be limited to, an analysis of the slope stability, spillway design, foundation conditions, seepage, and materials used. Recommendations for corrective measures should also be included if required.

Check List
Visual Inspection of Earth Dams
Department of Conservation
Division of Water Resources

Name of Dam Chancellor & Son

County Hardeman Date of Inspection March 10, 1981

ID # - State 35-7040 Federal TN06939

Type of Dam Earth

Hazard Category-Federal High State 1

Weather Clear, light winds Temperature 60°

Pool at Time of Inspection _____ (distance from crest)

Tailwater at Time of Inspection _____ (distance from stream bed)

Design/As Built Drawings Available: Yes X No ____

Location: Buck Chancellor; Engineer - Harry Pulton

Copy Obtained: Yes X No ____

Reviewed: Yes X No ____

Construction History Available: Yes ____ No X

Location: _____

Copy Obtained: Yes ____ No ____

Reviewed: Yes ____ No ____

Other Records and Reports Available: Yes X No ____

Location: Soil test by Spigolon - Buck Chancellor

Copy Obtained: Yes X No ____

Reviewed: Yes X No ____

Prior Incidents or Failures: Yes ____ No X

Inspection Personnel and Affiliation:

Ed O'Neill - TDWR _____

Bill Culbert - TDWR _____

George Moore - TDWR _____

Anthony Privett - TDWR _____

I. Embankment

A. Crest

Description (1st inspection) Sinusoidal

1. Longitudinal Alignment Drops at each end and slopes toward the lake.

2. Longitudinal Surface Cracks None seen

3. Transverse Surface Cracks None seen

4. General Condition of Surface O.K.; sparse grass.

5. Miscellaneous

B. Upstream Slope

1. Undesirable Growth or Debris Some debris accumulated above water surface.

2. Sloughing, Subsidence, or Depressions Some erosion from surface runoff; gullies up to 2' deep.

3. Slope Protection Sparse vegetation.

a. Condition of Riprap None

b. Durability of Individual Stones N/A

c. Adequacy of Slope Protection Against Waves and Runoff Poor

d. Gradation of Slope Protection - Localized Areas of Fine Material N/A

4. Surface Cracks None seen; some surface erosion; one gully about 2' deep.

C. Downstream Slope

1. Undesirable Growth or Debris Small pine trees near crest; 2 rows 3' and 8' below crest.

2. **Sloughing, Subsidence, or Depressions; Abnormal Bulges or Non-Uniformity** Erosion reaching about 1' deep near toe occurring all along slope.

3. **Surface Cracks on Face of Slope** None seen

4. **Surface Cracks or Evidence of Heaving at Embankment Toe** None seen

5. **Wet or Saturated Areas or Other Evidence of Seepage on Face of Slope; Evidence of "Piping" or "Boils"** Lower ¼ of slope saturated; slight seepage along toe; spring (as per owner) emerges at end of service spillway; large furrow about 80' right of service spillway has pooled water and seepage.

6. **Drainage System** CMP partially clogged; flow around pipe; see no. 5.

7. **Fill Contact with Outlet Structure** Some erosion; poor fill around pipe.

8. **Condition of Grass Slope Protection** Poor; fullest near crest.

D. Abutments

1. Erosion of Contact of Embankment with Abutment from Surface Water Runoff, Upstream or Downstream

D/S left abutment is highly eroded.

2. Springs or Indications of Seepage Along Contact of Embankment with the Abutments General seepage in area around and below spillway exit channel; flow about 2-3 gpm.

3. Springs or Indications of Seepage in Areas a Short Distance Downstream of Embankment - Abutment Tie-in

None seen

Information From Owner

Harry Fulton, Engineer - Memphis
Spigolon Disc Testing Co. (Memphis) - soil compaction tests
Spring at toe located there before dam was completed about 1979.
Has never used spillway.
Drawdown drain has not been used.
Cutoff trench through center line of dam 6'-8' deep.

II. Area Downstream of Embankment, Including Channel

A. Localized Subsidence, Depressions, Sinkholes, Etc. None seen

B. Evidence of "Piping", "Boils", or "Seepage" Around service spillway.

C. Unusual Presence of Lush Growth, such as Swamp Grass, etc. All along toe; especially below spillway channel.

D. Unusual Muddy Water in Downstream Channel None seen

E. Sloughing or Erosion Some erosion

F. Surface Cracks or Evidence of Heaving Beyond Embankment Toe None seen

G. Stability of Channel Sideslopes Mostly filled with sediment.

H. Condition of Channel Slope Protection None

I. Adequacy of Slope Protection Against Waves, Currents, and Surface Runoff O.K.

J. Miscellaneous

K. Condition of Relief Wells, Drains, and Other Appurtenances None

L. Unusual Increase or Decrease in Discharge from Relief Wells None

III. Instrumentation - None

A. Monumentation/Surveys _____

B. Observation Wells _____

C. Weirs _____

D. Piezometers _____

E. Other _____

IV. Spillways

A. Service Spillway (Service/Emergency Combination Yes __ No X)

1. Irtake Structure Condition O.K.

2. Outlet Structure Condition 8" concrete plug; crack at start of chute.

3. Pipe Condition O.K.

4. Evidence of Leakage or Piping

5. General Remarks Spillway never used as per owner; design appears questionable as to ability to carry significant flows.

B. Emergency Spillway

1. General Condition O.K.

2. Entrance Channel Steep

3. Control Section No fill material.

3. Exit Channel _____

4. Vegetative/Woody Cover _____

5. Other Observations Probably low spot at left abutment; not intended as a spillway; design would cause sudden release of water due to breaching of fill material.

V. Emergency Drawdown Facilities (if part of service spillway so state) 10" CMP valve upstream; plug downstream

Are Facilities Operable: Yes _____ No _____ Unknown

Were Facilities Operated During Inspection: Yes _____ No X

Date Facilities Were Last Used Unknown

VI. Reservoir

A. Slopes O.K.; steep

B. Sedimentation Minor

C. Turbidity Brown; less than 6" visibility.

VII. Drainage Area

Description (for hydrologic analysis) Woods terraced; attempted grass cover.

A. Changes in Land Use

VIII. Downstream Area (Stream) - empties into spring

A. Condition (obstructions, debris, etc.) _____

B. Slopes _____

C. Approximate No. Homes, Population, and Distance D/S

Homes 200' and 600' downstream.

D. Other Hazards Residential access roads.

IX. Miscellaneous

Incidents/Failures None

Observed Geology of Area Sand

X. Conclusions

Appears poorly constructed but no overt signs of instability were noted. Spillway capacity appears sufficient but is poorly designed and could cause failure at high stages. Excessive flow is emerging at the toe but no movement of material was seen. Dam is significantly deficient.

XI. Recommendations

A qualified engineer should be engaged to do the following:

1) Determine the source of the seepage flow and develop, as necessary, a method for stopping the flow or safely passing the flow from the embankment.

2) Analysis of the stability of the embankment.

3) Analysis of the stability of the spillways to handle flow and develop as necessary facilities which will safely pass the flows required.

George S. Mace
Regional Engineer

Chief Engineer

OHIO RIVER DIVISION, NASHVILLE DISTRICT
SOIL TEST DATA SUMMARY

PROJECT CHANCELLOR & SONS HOLE 1 ELEV. TOP _____ SHEET 1 OF 1 SHEETS

SAMPLE NO.	DEPTH OF SAMPLE	LABORATORY CLASSIFICATION	NAT. WATER CONT.	ATTERBERG LIMITS		MECHANICAL ANAL.		
				LL	PL	Gravel %	Sand %	Fines %
1	0.0-1.0	RED SILTY SAND, LOOSE, SLIGHTY DAMP, W/ NUMEROUS SMALL SCATTERED CLAY ZONES, SLIGHTLY MICACEOUS, SLIGHTLY CARBONACEOUS. (SC)	10.0	30.9	13.6	0.0	76.6	23.4

ORN 348
SEPT 67

ORNED-D

APPENDIX E

HYDRAULIC AND HYDROLOGIC DATA

EVENT	ANTECEDENT MOISTURE CONDITION	
	II	III
PMF	Passes 0' of freeboard	Not routed
½ PMF	Passes 0.7 feet of freeboard	Not routed
100 - YEAR	Not routed	Passes 2' of freeboard

HYDRAULIC AND HYDROLOGIC CALCULATIONS

Chancellor and Son Dam is located in Hardeman County, Tennessee. The primary land uses are lawn/homestead and woods with about 10% of the area water. The predominant soil types are Ruston (HSG B), Lexington (HSG E), and Providence (HSG C). The Runoff Curve Number was calculated to be 70 under Antecedent Moisture Condition II.

The Chancellor and Son Dam is a small size, high hazard potential dam. As such, it is required to pass the one-half to the full Probable Maximum Flood (PMF) without overtopping. The PMF is derived from the Probable Maximum Precipitation (PMP). Using the U. S. Weather Service TP-40, the 6-hour PMP was estimated to be 29.7 inches yielding 25.1 inches of runoff.

The total inflow into the reservoir during the PMF is about 83.7 acre-feet with a peak rate of about 862 cfs. Chancellor and Son lake has maximum storage above normal pool of about 13.6 acre-feet and maximum spillway discharge of 764 cfs. The impoundment is sufficient to pass the full PMF. The dam contained the storm with no remaining freeboard.

Analysis of the 100-year storm using AMC II produced a flow of 0.3 feet in the emergency spillway.

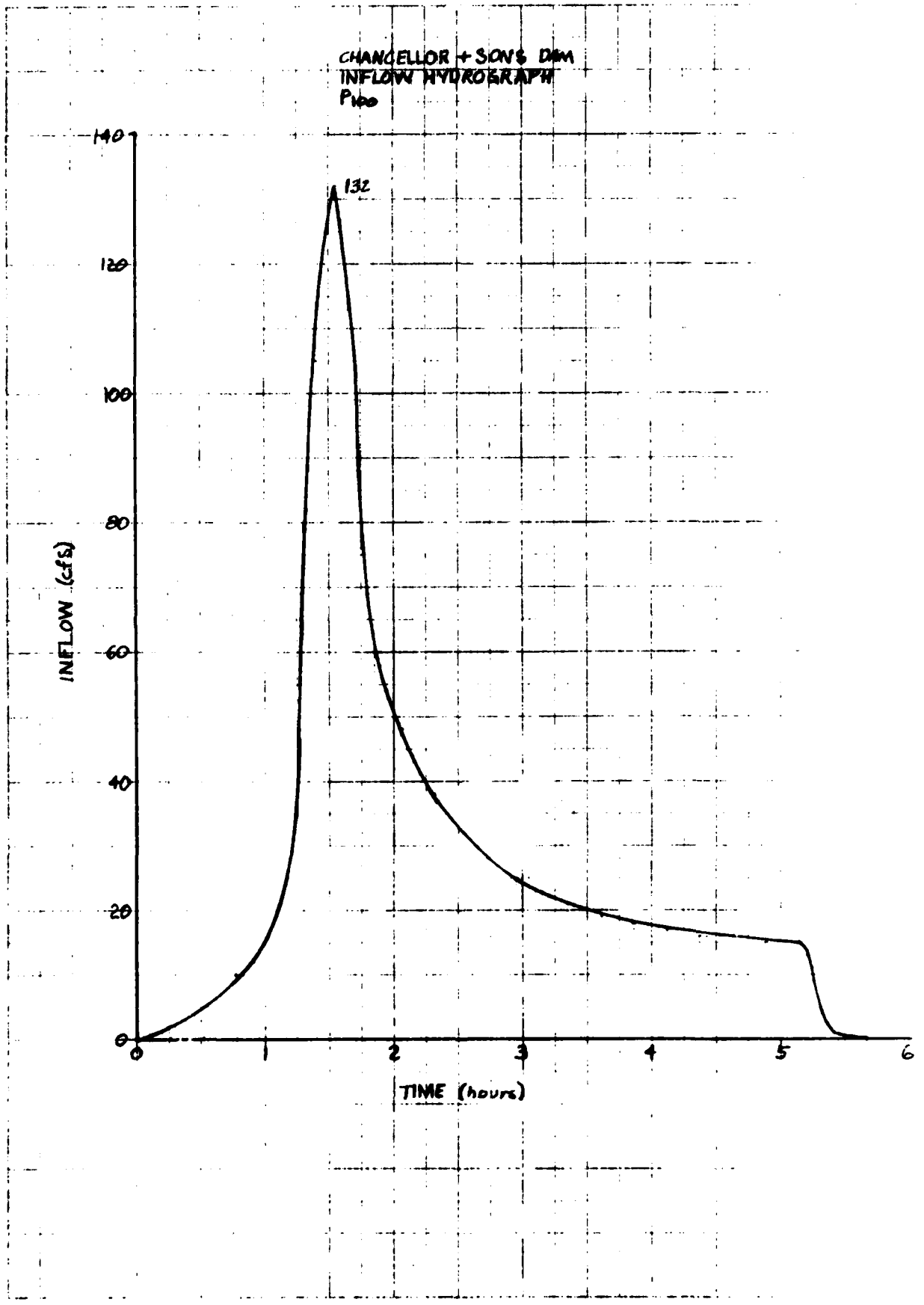
Although the dam has sufficient capacity to pass the full PMF in its present configuration, it is unlikely that the dam could survive the ½ PMF. The emergency spillway is founded partially on fill material. During the peak of the outflow during the ½ PMF, the velocity in the emergency spillway channel exceeded 5 fps. The high velocities over a relatively narrow section of fill (15 foot crest width) would probably cause a rapid deterioration of the fill section and possibly lead to failure of the dam.

The inflow hydrographs were calculated by methods contained in Section 4, Chapter 21, of the SCS National Engineering Handbook. Hydraulic calculations were performed in accordance with King & Braters' "Handbook of Hydraulics". The routings were taken from NEH-4, Chapter 17. Equation 17-11 was rearranged to the following form:

$$I_1 + I_2 + \left(\frac{2S_1}{\Delta t} - O_1\right) = \left(\frac{2S_2}{\Delta t} + O_2\right)$$

DA = 40 Ac = .06 Mi²
CN = 70 AMC II , 85 AMC III
NPA = 3.3 Ac
PREDOMINANT SOIL GROUPS : RUSTON (B), LEXINGTON (B), PROVIDENCE (-)
COVER: WOODS (40%), LAWN-HOMESTEAD (50%), WATER (10%)
FETCH = 500 FT
REACH (ℓ) = 1200 FT
MAX RELIEF = 85 FT
SLOPE (Y) = 13.1%

AMC II	AMC III
L = .14 hr	L = .09 hr
T_c = .23 hr	T_c = .14 hr
T_p = .16 hr	T_p = .10 hr
PMP = 29.7 IN	P_{100} = 5.5 IN
Q = 25.1 IN	Q = 3.8 IN
HYDROGRAPH FAMILY = 1	HYDROGRAPH FAMILY = 2
T_o = 5.61 hr	T_o = 5.15 hr
T_o/T_p = 35.5	T_o/T_p = 51.2
REV T_o/T_p = 36	REV T_o/T_p = 50
REV T_p = .156 hr	REV T_p = .103 hr
q_p = 194 cfs/IN	q_p = 294 cfs/IN
Q_{qp} = 4872 cfs	Q_{qp} = 1116 cfs
q_{max} = 862 cfs @ 2.12 hr	q_{max} = 132 cfs @ 1.55 hr


CHANCELLOR + SONS DAM
INFLOW HYDROGRAPH
P100
140
120
100
80
60
40
20
0
132
INFLOW (cfs)
0
1
2
3
4
5
6
TIME (hours)

CHANCELLOR + SONS DAM P_{100} INFLOW HYDROGRAPH 20 MAR 81 sheet 2

Q_{qp} = 1116 cfs T_p = .103 hr

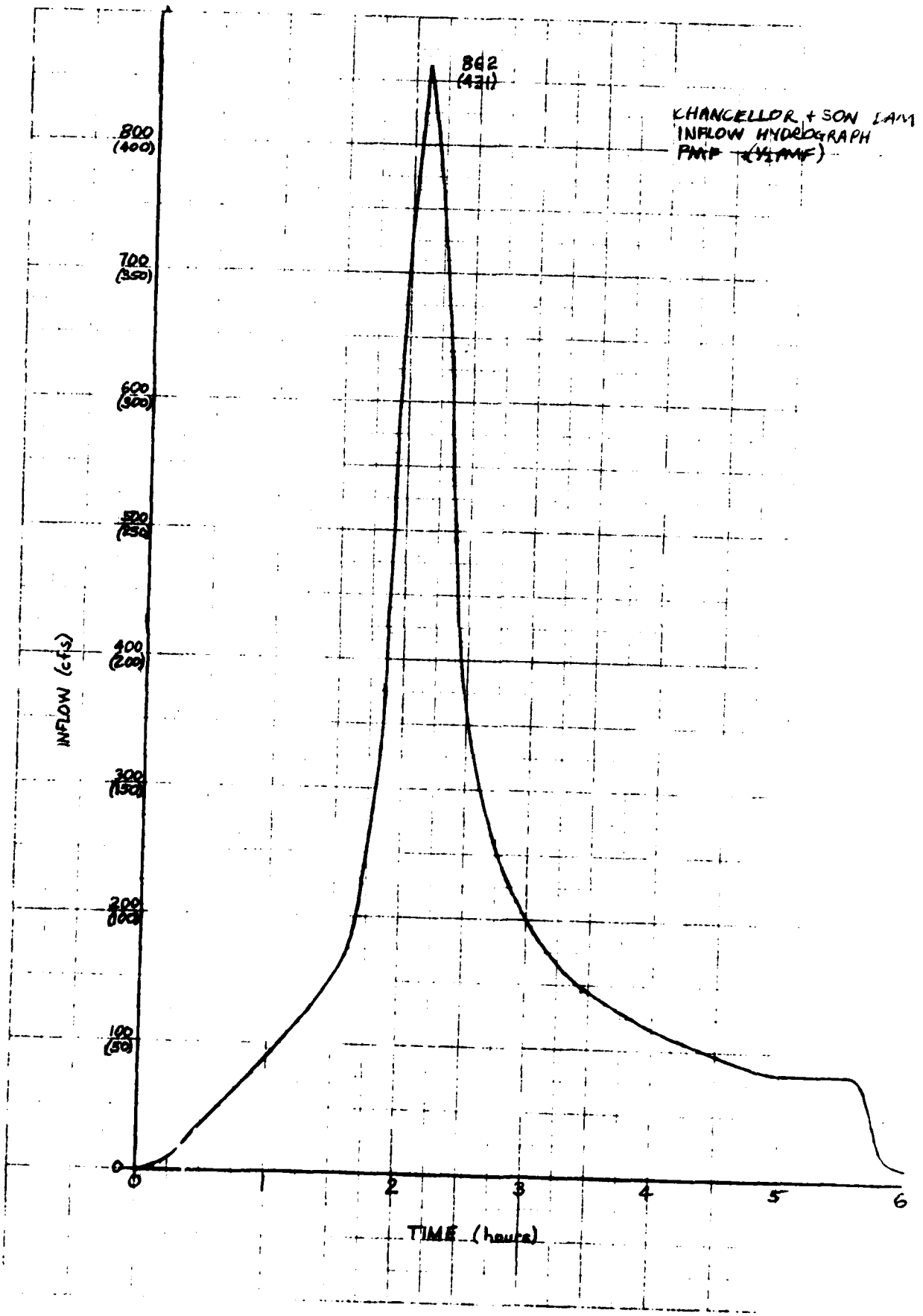
HYDROGRAPH FAMILY # 2 T_c/T_p = 50

t/T_p	t (hr)	q_c/q_p	q (cfs)
0	0	0	0
2.5	.26	.0018	2
5.0	.52	.0047	5
7.5	.77	.0087	10
10.0	1.03	.0145	16
12.5	1.29	.0615	69
15.0	1.55	.1189	132
17.5	1.80	.0621	69
20.0	2.06	.0433	48
22.5	2.32	.0342	38
25.0	2.58	.0274	31
27.5	2.83	.0234	26
30.0	3.09	.0209	23
32.5	3.35	.0187	21
35.0	3.61	.0167	19
37.5	3.86	.0159	18
40.0	4.12	.0153	17
42.5	4.38	.0147	16
45.0	4.64	.0142	16
47.5	4.89	.0136	15
50.0	5.15	.0131	15
52.5	5.41	.0008	1
55.0	5.67	0	0

$607 \frac{cfs}{} \times .26 \text{ hr} \times \frac{3600 \frac{sec}{hr}}{43560 \frac{ft^2}{ac}} = 12.9 \text{ Acft}$

$3.8 \text{ IN} \times 40 \text{ Ac} \times \frac{1 \text{ F}}{12 \text{ IN}} = 12.7 \text{ Acft}$

OK


862
(431)
CHANCELLOR + SON DAM
INFLOW HYDROGRAPH
PMP ~~(½ PMF)~~
800
(400)
700
(350)
600
(300)
500
(250)
400
(200)
300
(150)
200
(100)
100
(50)
0
INFLOW (cfs)
0
1
2
3
4
5
6
TIME (hours)

CHANCELLOR + SONS DAM | P100 ROUTING | 20MAR 81 | SCS-7.1. 7

TIME (hr)	INFLOW (cfs)	$2S/\Delta t - O$	$2S/\Delta t + O$	OUTFLOW (cfs)	
0	0	0	0	0	
.26	2	2	2	0	
.52	5	9	9	0	
.78	9	23	23	0	
1.04	17	49	49	0	
1.30	75	139	141	1	
1.56	132	330	346	8	
1.82	66	464	528	32	
2.08	47	495	577	41	
2.34	37	496	579	42	
2.60	31	485	563	39	PEAK PASSES.
2.86	26	472	542	35	
3.12	23				
3.38	21				
3.64	19				
3.90	18				
4.16	17				
4.42	16				
4.68	16				
4.94	15				

CHANCELLOR & SONS DAM | PMF INFLOW HYDROGRAPH | ZONAR 81

Q_{gp} = 4872 cfs T_p = .156 hr

HYDROGRAPH FAMILY # 1 T_o/T_p = 36

No.	t/T_p	t (hr)	q_c/q_p	½ PMF q (cfs)	PMF q (cfs)
1	0	0	0	0	0
2	1.7	.27	.002	5	10
3	3.4	.53	.008	20	39
4	5.1	.80	.014	34	68
5	6.8	1.06	.020	49	97
6	8.5	1.33	.026	63	127
7	10.2	1.59	.033	80	161
8	11.9	1.86	.077	188	375
9	13.6	2.12	.177	431	862
10	15.3	2.39	.101	246	492
11	17.0	2.65	.058	141	283
12	18.7	2.92	.044	107	214
13	20.4	3.18	.036	88	175
14	22.1	3.45	.030	73	146
15	23.8	3.71	.027	66	132
16	25.5	3.98	.024	58	117
17	27.2	4.24	.022	54	107
18	28.9	4.51	.020	49	97
19	30.6	4.77	.018	44	88
20	32.3	5.04	.017	41	83
21	34.0	5.30	.017	41	83
22	35.7	5.57	.017	41	83
23	37.4	5.83	.004	10	19
24	39.1	6.10	.002	5	10
25	40.8	6.36	0	0	0

$3868 \times .21 \times \frac{1600}{43560} = 29.8$ Ac. ft

$25.4 \times 40 \times \frac{1}{12} = 84.7$ Ac. ft

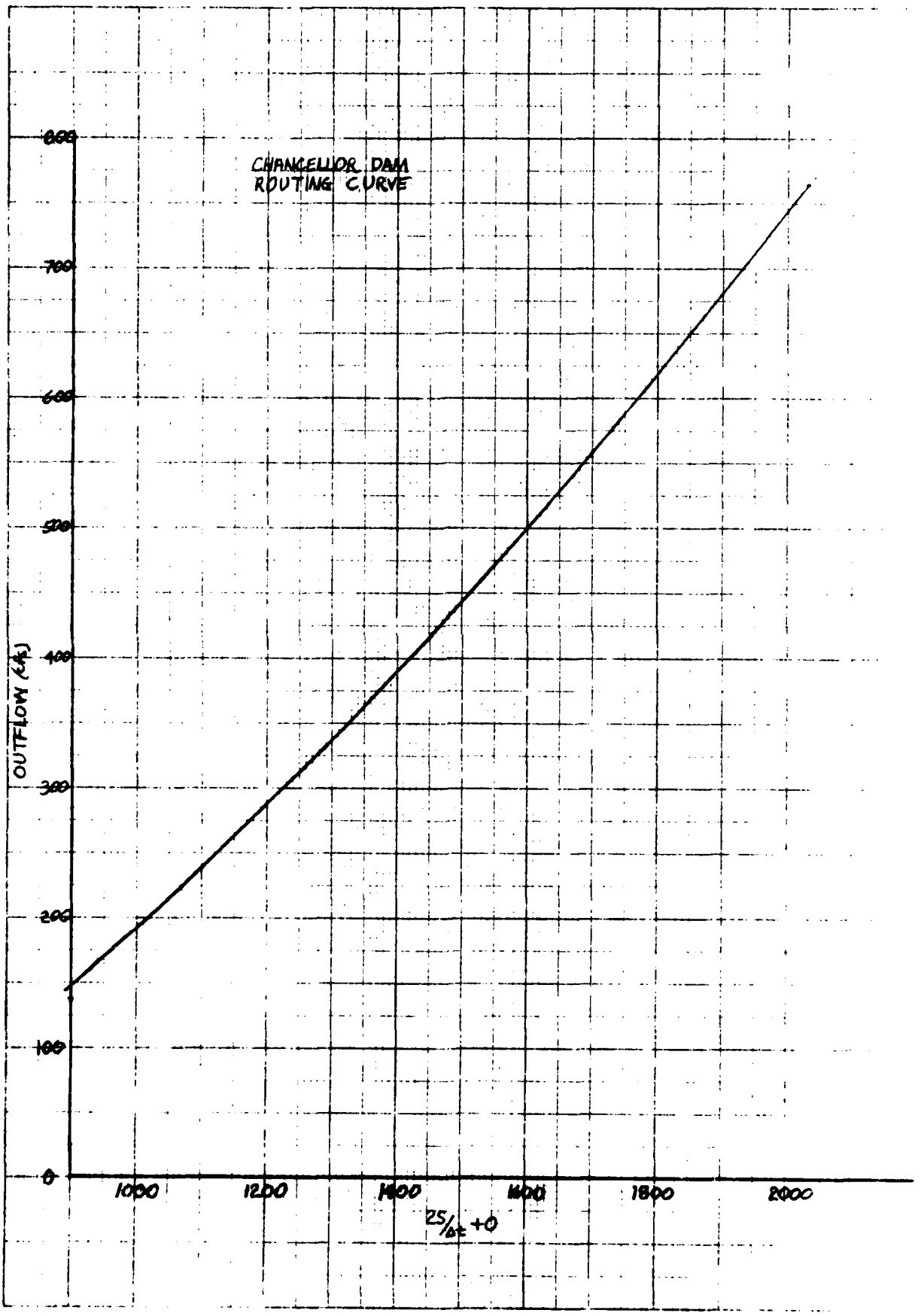
OK

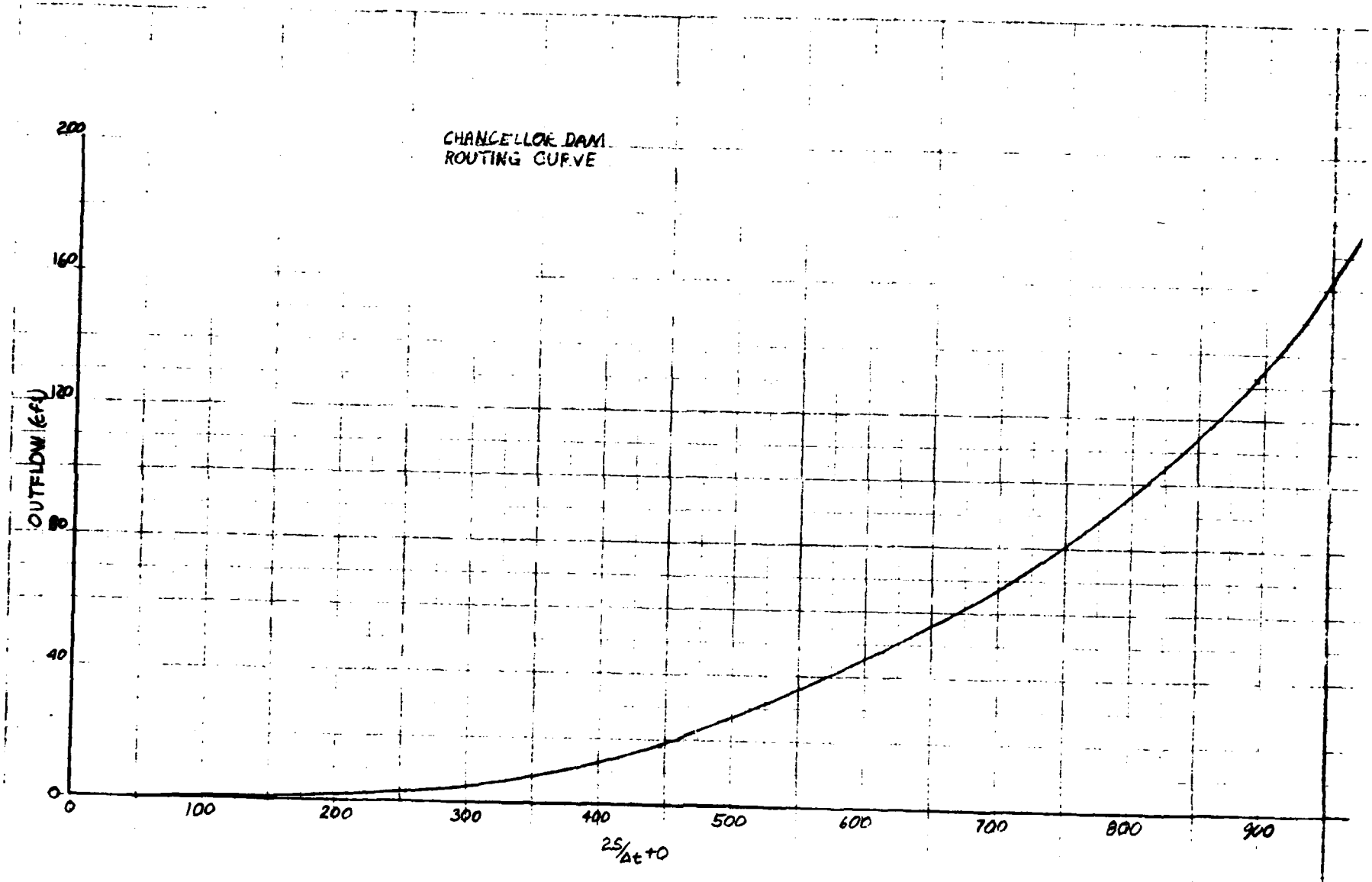
CHANCELLOR + SON DAM | PMF ROUTING | 20MAR 81 | S.O.

TIME (hr)	INFLOW (cfs)	2S/Δt −O	2S/Δt +O	OUTFLOW(cfs)	
0	0	0	0	0	
.26	10	10	10	0	
.52	36	56	56	0	
.78	65	155	157	1	
1.04	94	306	314	4	
1.30	125	461	525	32	
1.56	165	587	751	82	
1.82	315	617	1067	225	
2.08	862	564	1794	615	
2.34	620	518	2046	764	
2.60	308	616	1446	415	PEAK OUTFLOW
2.86	226	626	1150	262	
3.12	183		1035	207	
3.38	152				
3.64	136				
3.90	121				
4.16	109				
4.42	100				
4.68	91				
4.94	84				

CHANCELLOR + SON dam | ½ PMF ROUTING | 20 MAR 91 | 30 of 1

TIME (hr)	INFLOW (CFS)	$2S/\Delta t - O$	$2S/\Delta t + O$	OUTFLOW (cfs)	
0	0	0	0	0	
.26	5	5	5	0	
.52	18	28	28	0	
.78	33	77	79	1	
1.04	47	155	157	1	
1.30	62	258	264	3	
1.56	82	376	402	13	
1.82	155	517	613	48	
2.08	431	623	1103	240	
2.34	316	624	1364	370	
2.60	150	622	1092	235	PEAK PASSES
2.86	113	529	893	132	
3.12	91		733	76	
3.38	77				
3.64	68				
3.90	61				
4.16	55				
4.42	50				
4.68	45				
4.94	42				


CHANCELLOR DAM
ROUTING CURVE
OUTFLOW (cfs)
800
700
600
500
400
300
200
100
0
1000
1200
1400
1600
1800
2000
25/0± +0


CHANCELLOR DAM
ROUTING CURVE
OUTFLOW (cfs)
200
160
120
80
40
0
0
100
200
300
400
500
600
700
800
900
2S/Δt+O

CHANCELLOR + SON DAM SPILLWAY RATING

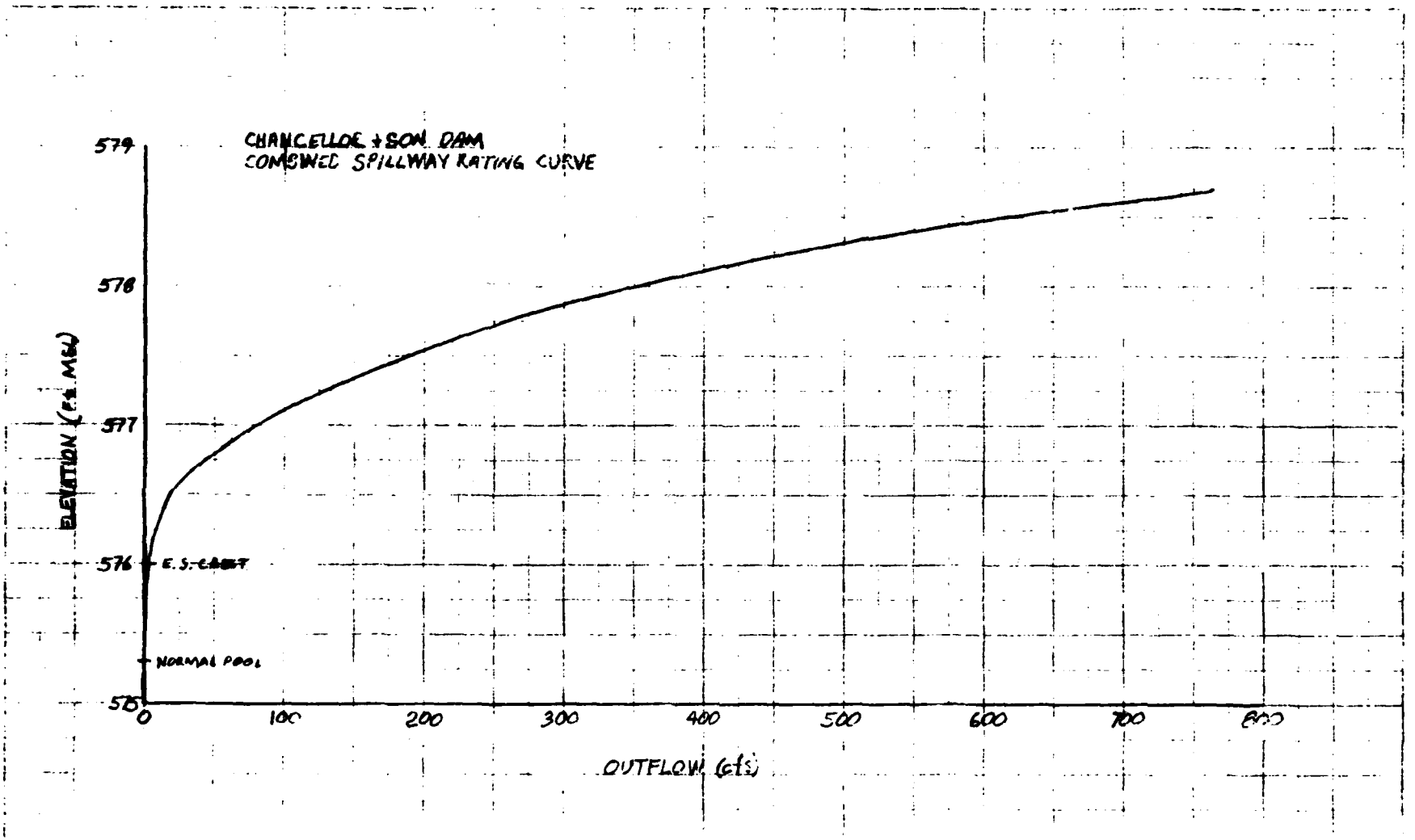
ELEVATION	SERVICE SPILLWAY				EMERGENCY SPILLWAY		TOTAL OUTFLOW
FT MSL	H_m (ft)	H_m/D	K'_c	Q (cfs)	H_m	Q (cfs)	Σ Q (cfs)
575.3	0	0	0	0	0	0	0
576	.7	.23	.1789	2.8	0	0	2.8
576.5	1.2	.40	.503	7.8	.5	10.5	18.3
577.5	2.2	.73	1.529	23.8	1.5	169.4	193.2
578.1	2.8	.93	2.31	36.0	2.1	381.3	417.3
578.7	3.4	1.13	3.138	48.9	2.7	714.8	763.7

SERVICE SPILLWAY $Q = K_c' d^{5/2}$ $d = 3$ ft K_c' FROM TABLE 8-12 KING HANDBOOK p. 8-

EMERGENCY SPILLWAY $Q = 2.295 Z H_m^{3/2}$ $Z = 2.6$ KING'S HANDBOOK p. 8

ROUTING CURVE

HEIGHT (Ft)	AREA (AC)	STORAGE (Ac Ft)	STORAGE (CF)	$S/\Delta t$ (.26 hr cfs)	OUTFLOW (cfs)	$2S/\Delta t + O$
0	3.8	0	0	0	0	0
.7	3.88	2.7	1.36	126	3	259
1.2	3.93	4.6	2.32	214	18	446
2.2	4.05	8.6	4.34	400	183	785
2.8	4.13	11.1	5.60	517	417	1451
3.4	4.2	13.6	6.86	633	764	2795


CHANCELLOR + SON DAM
COMBINED SPILLWAY RATING CURVE
579
578
577
576
575
ELEVATION (Ft. MSL)
E.S. CREST
NORMAL POOL
0
100
200
300
400
500
600
700
800
OUTFLOW (cfs)

CHANCELLOR + SON BREACH HYDROGRAPH 26 MAY 91 96-1

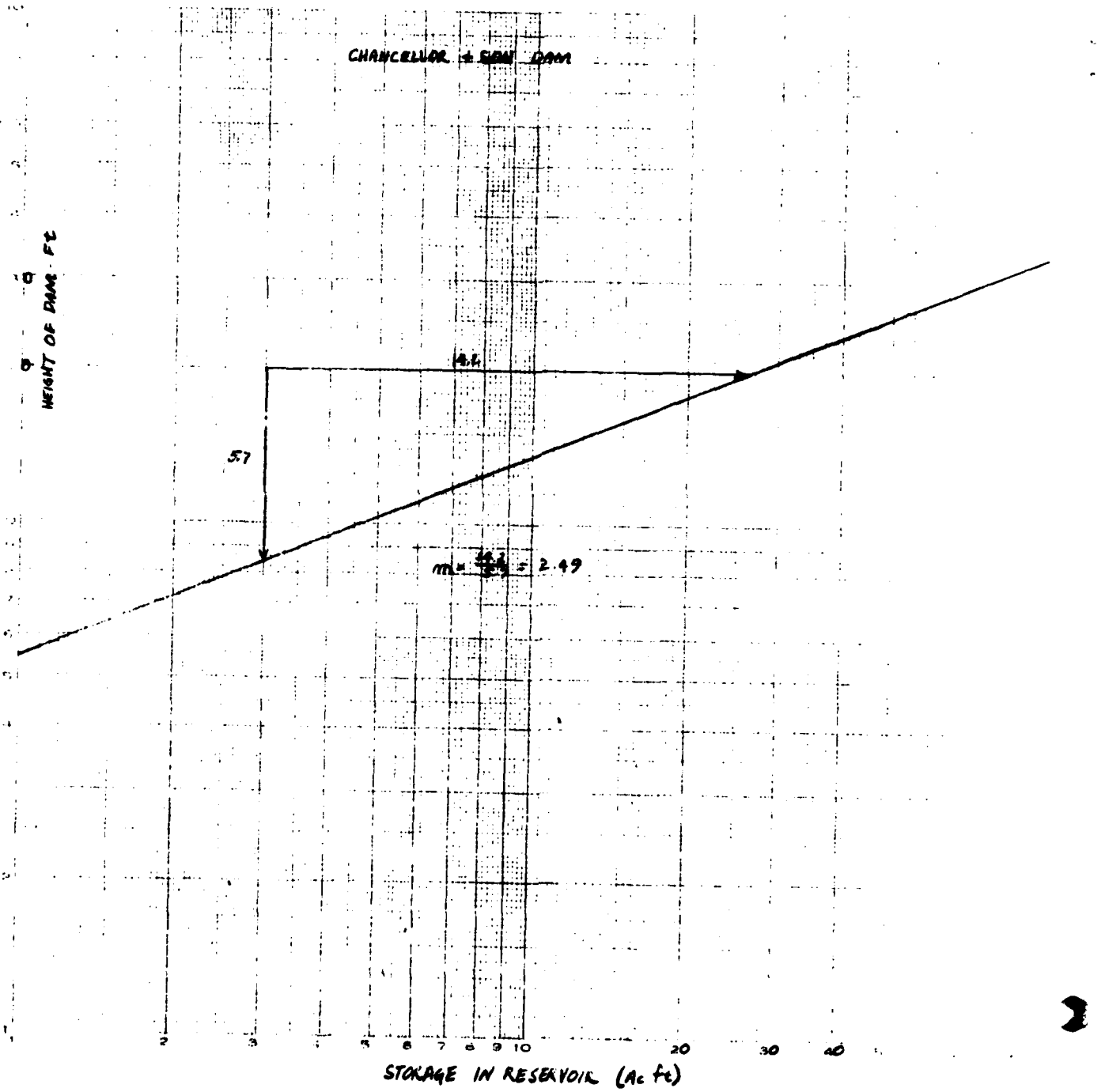
ASSUME INSTANTANEOUS SQUARE BREACH WIDTH = HEIGHT of DAM

$Q_{max} = 3.2 L h^{3/2}$ $L = 25$ $h = 24.35$

$= 9027$ cfs

$T_R = \frac{46.4 \text{ Ac-ft} \times 43560 \text{ ft}^3/\text{Ac}}{9027 \text{ cfs}} = 223.9$ sec.

$\frac{Q}{Q_{max}}$	$\frac{t(10^5)}{t_R}$	t (hours)	Q (cfs) BREACH	Q (cfs) INFLOW
1.0	0	0	9027	310
.8	62	.014	7222	295
.6	145	.032	5416	276
.4	253	.057	3611	250
.2	445	.100	1805	205
.1	67	.14	903	175


CHANCELLOR + SIDE DAM
HEIGHT OF DAM - Ft
4.4
5.7
m = 4.4/1.8 = 2.49
2
3
5
6
7
8
9
10
20
30
40
STORAGE IN RESERVOIR (Ac ft)

SPIGOLON - DISC 3037 FLEETBROOK DRIVE • MEMPHIS, TENNESSEE 38116 (901) 396-0961
ENGINEERING □ TESTING □ INSPECTION □ DRILLING

J. C. ✓ L. M. ✓ APR 7 ESTR

SOIL FIELD DENSITY TEST REPORT

PROJECT Dam - Hardeman County Tennessee Job No. 484

FOR L. M. Chancellor & Son, 7474 Raleigh La Grange Road, Germantown, Tennessee 38138

REPORT NO. 1 PAGE 1 OF 1 DATE OF TEST April 5, 1978

Test No.	TEST LOCATION	Elevation or Lift No.	Mat'l Mark	Moisture Content %	Dry Density PCF	Percent Compaction Req'd.	Percent Compaction Actual
1	Station #0+75 Centerline of Core Trench		A	12	119.3	95	99
2	Station #1+50 10' left of Centerline of Core Trench		A	10	120.7	95	100
3	Station #2+25 15' Right of Centerline of Core Trench		A	7.8	115.0	95	96
4	Station #3+00 Centerline of Core Trench		A	7.5	122.3	95	102
5	Station #3+75 15' Left Centerline of Core Trench		A	10	122.6	95	102
6	Station #4+50 15' Right Centerline of Core Trench		A	10	123.2	95	102

NOTE: All density tests were six inches deep unless otherwise noted.

Mat'l. Mark	SOIL DESCRIPTION AND SOURCE	Max. Dry Density PCF	Optimum Moisture %	TEST METHOD
A	Red Clayey SAND	119.6	12.3	ASTM D-698

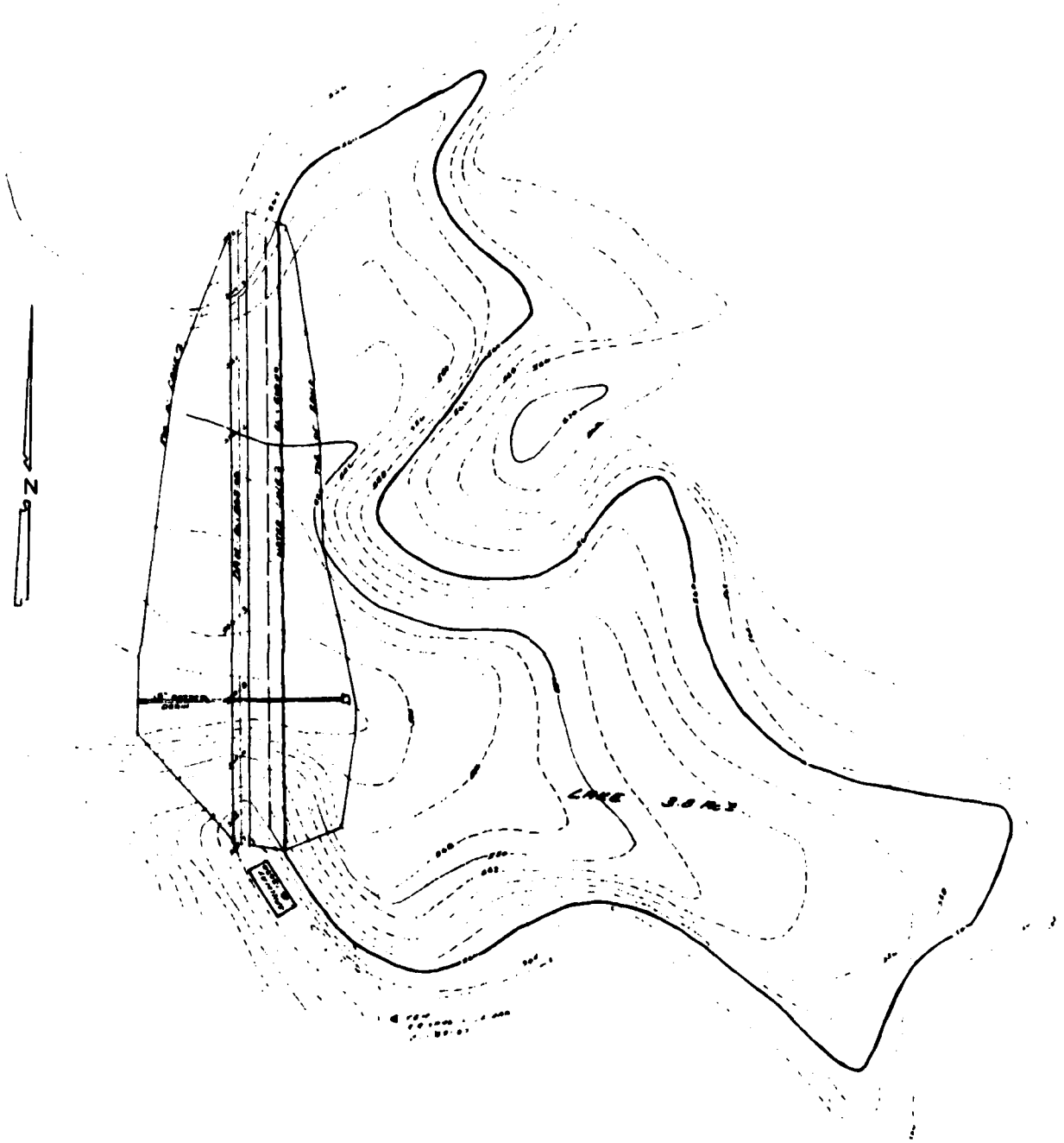
Copies to: Client (3)

RESPECTFULLY SUBMITTED,

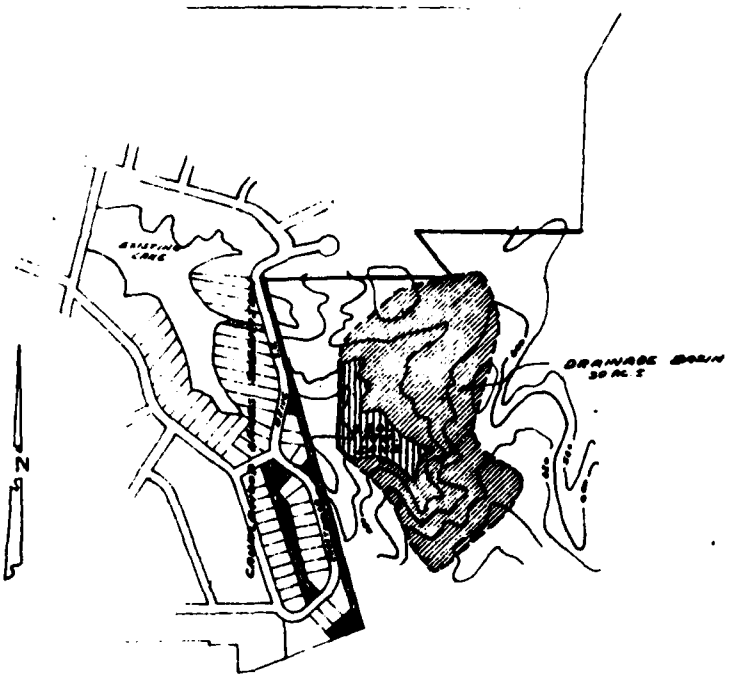
Robert F. Day Jr.

April 10, 1978

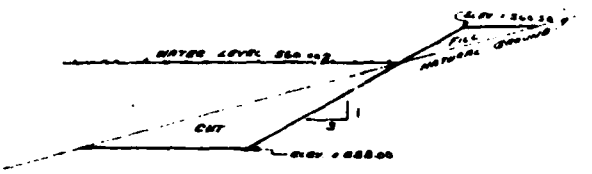
Serial No. R-617 Inspector D. Gray



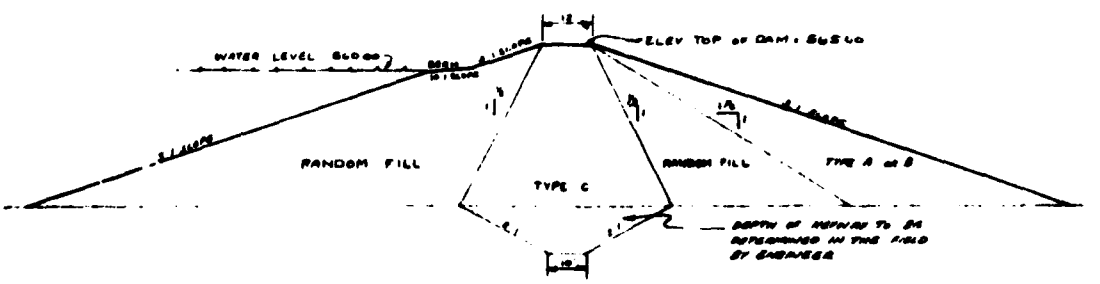
DAM & LAKE SITE



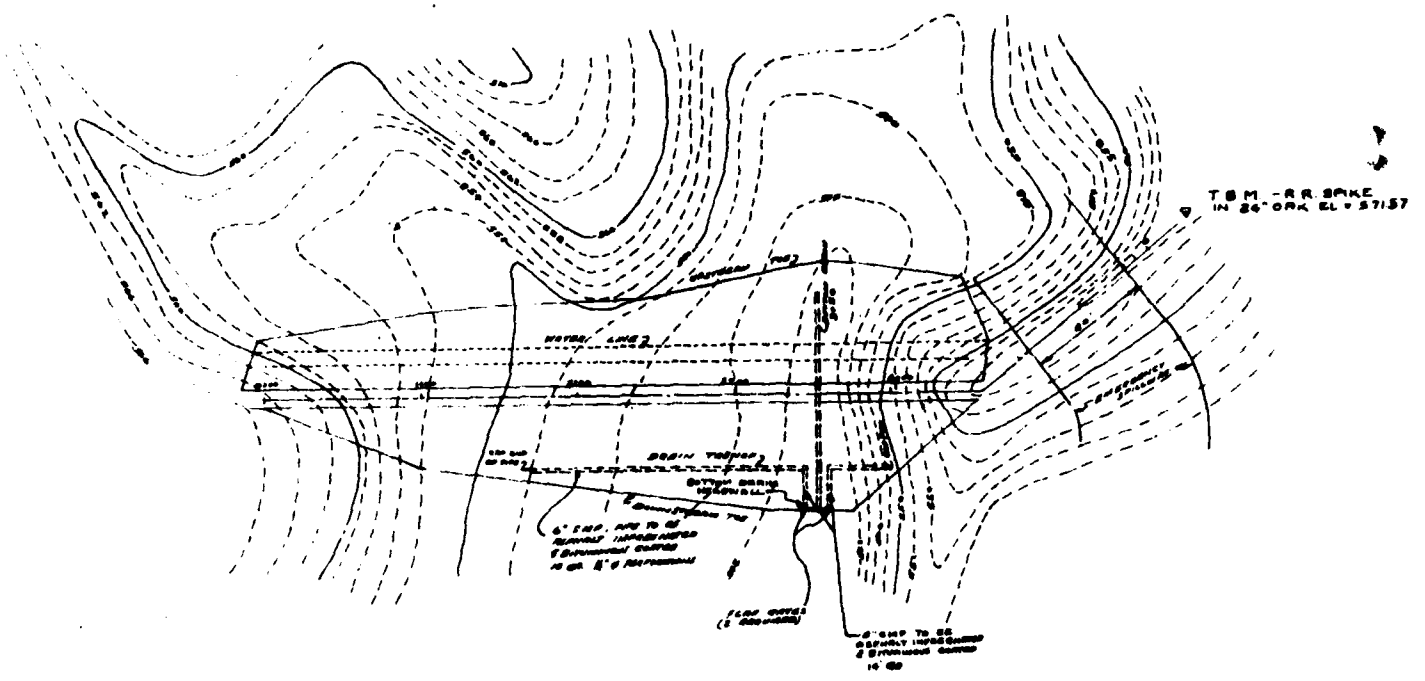
GENERAL SITE PLAN
SCALE 1" = 300'



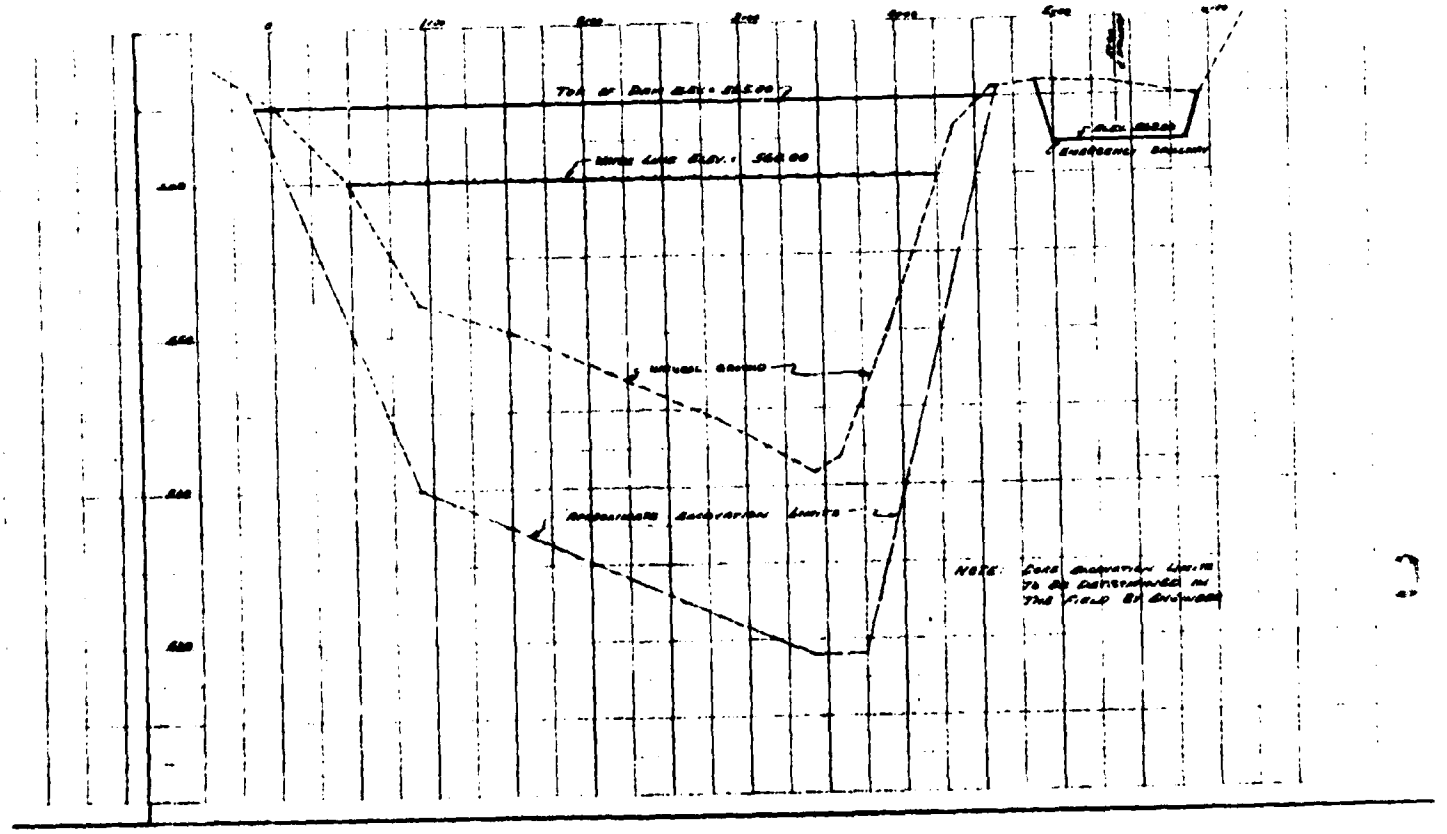
SHORELINE DETAIL n.t.s.

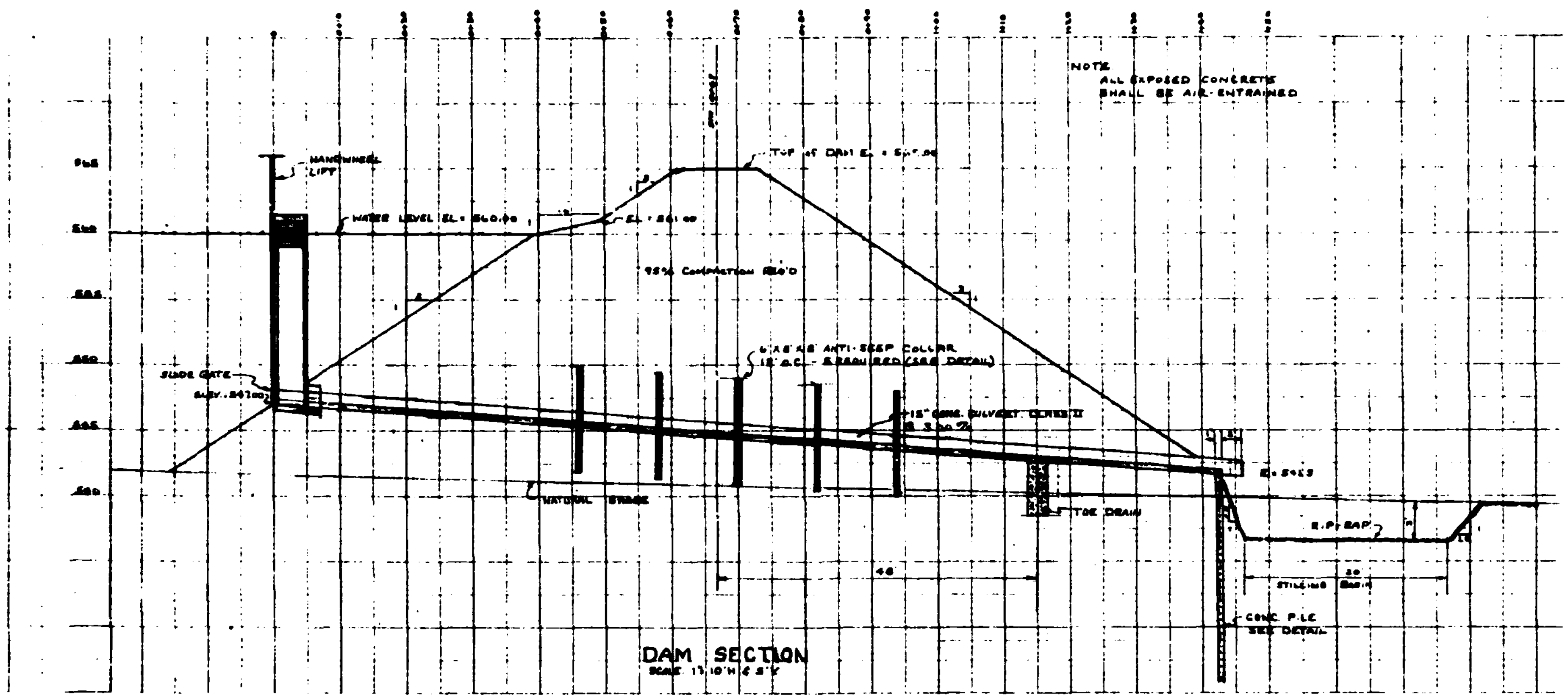


TYPICAL EMBANKMENT SECTION FOR DAM n.t.s.

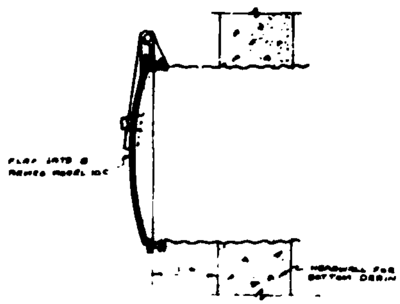

T.B.M. - R.R. SPIKE
IN 24" OAK EL = 97.57

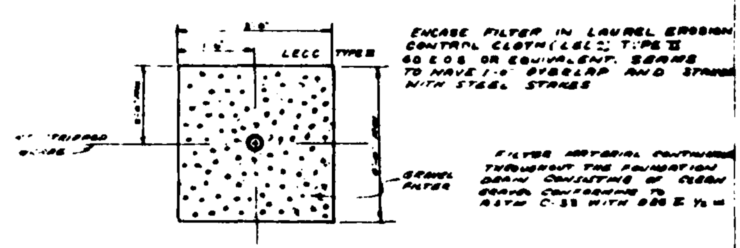
SCALE 1" = 5' & 50'


Top of Dam Elev. = 565.00
Water Line Elev. = 564.00
Natural Ground
Approximate Excavation Limits
Note: Exact excavation limits to be determined in the field by engineer

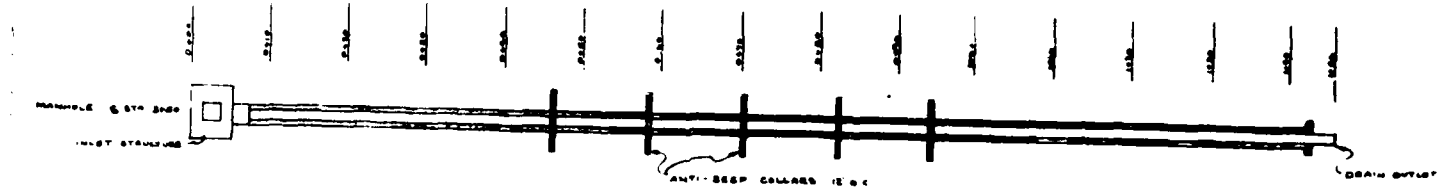


DAM SECTION


FLAP GATE DETAIL n.t.s.

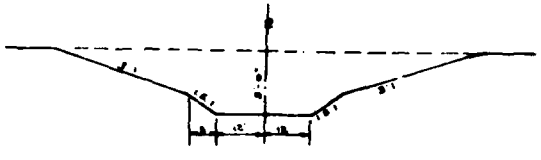


FOUNDATION DRAIN FILTER DETAIL n.t.s.

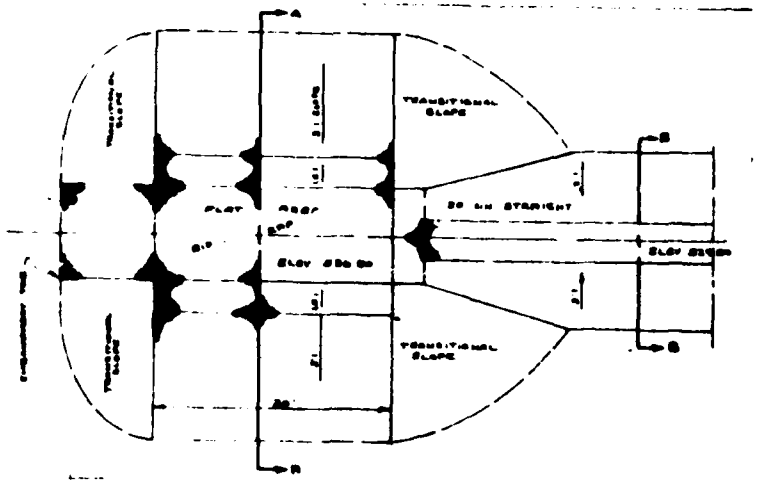


DRAIN PIPING PLAN

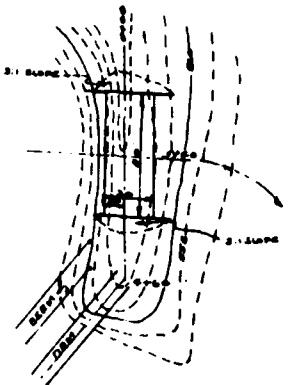
STILLING BASIN & OUTLET CHANNEL



SECTION "A-A" STILLING BASIN

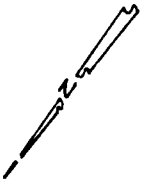


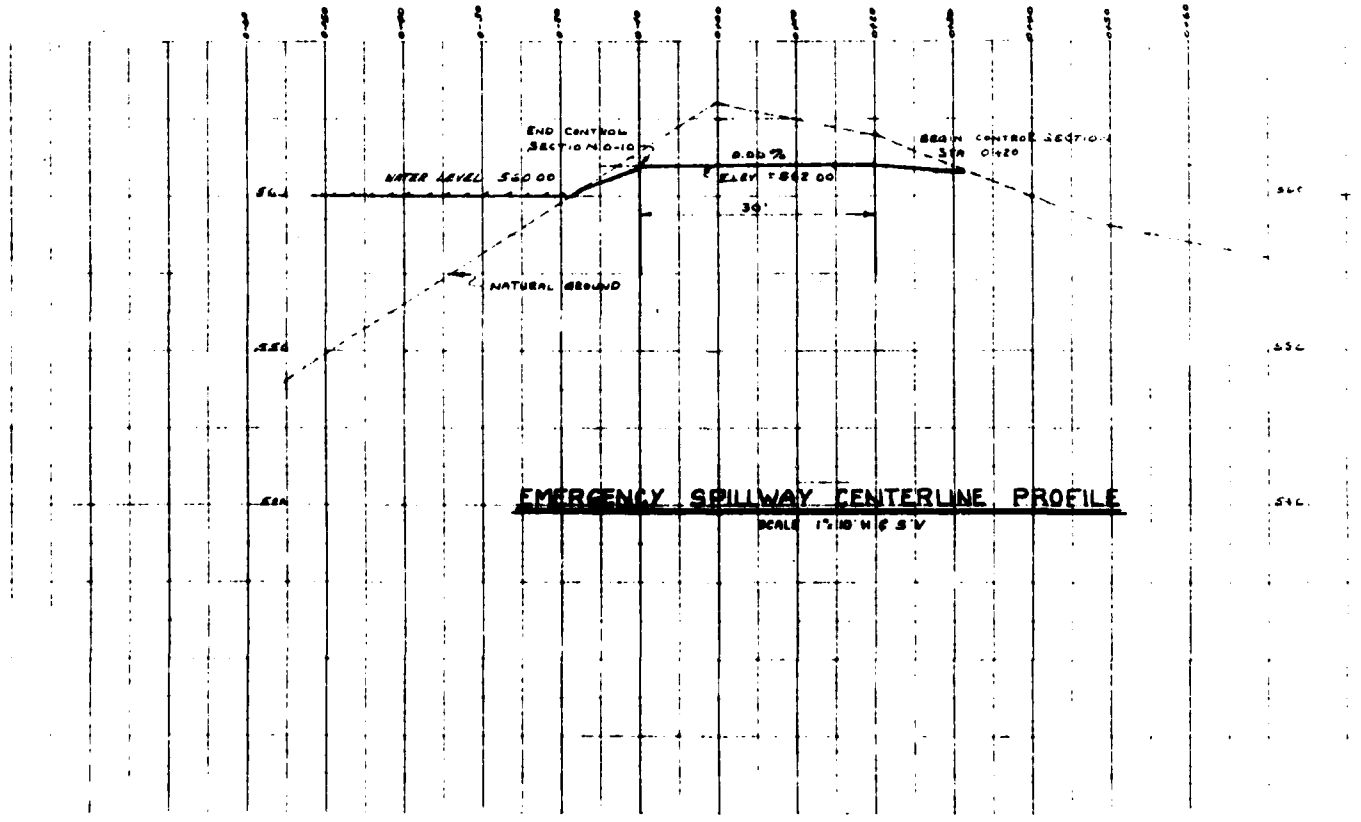
SECTION "B-B" DOWNSTREAM CHANNEL



EMERGENCY SPILLWAY PLAN

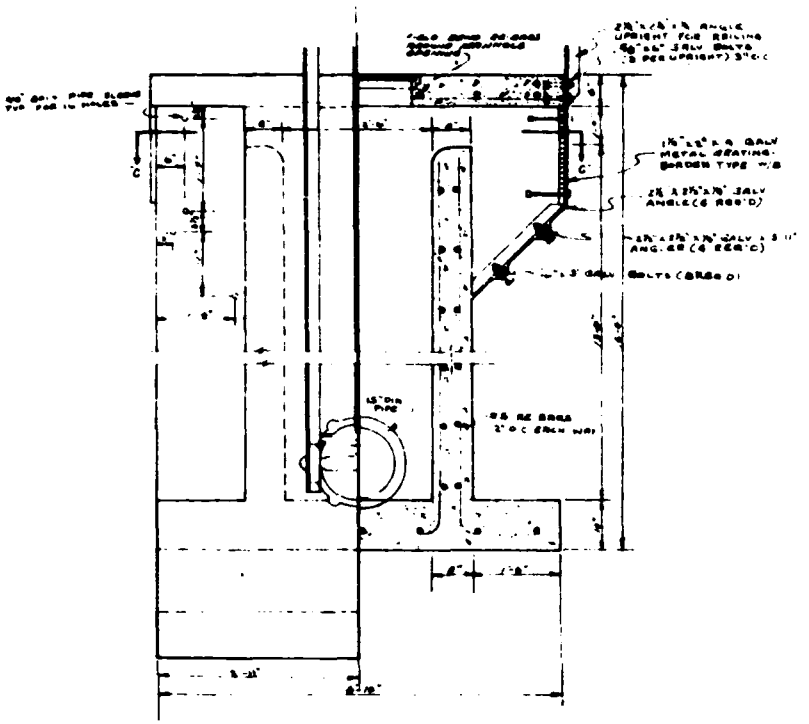
SCALE 1" = 50'



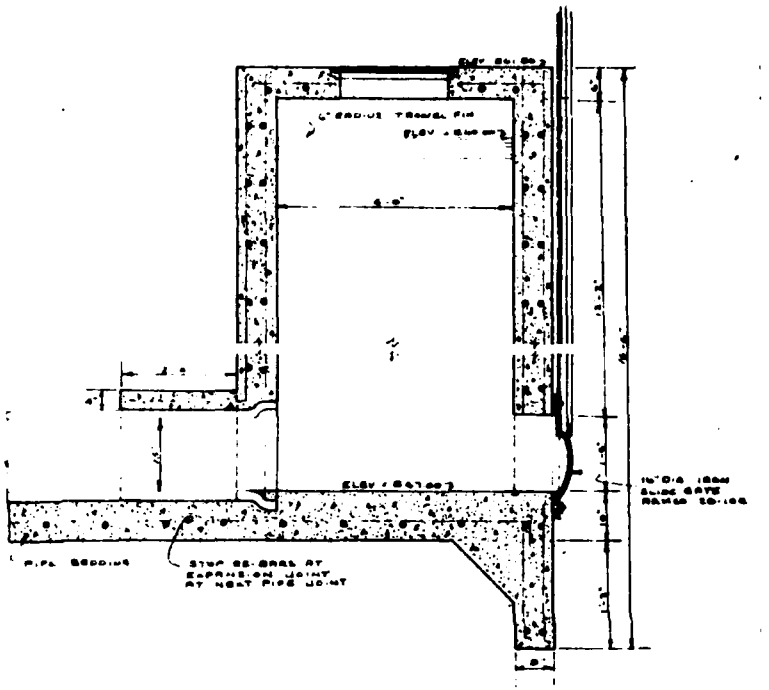


EMERGENCY SPILLWAY CENTERLINE PROFILE

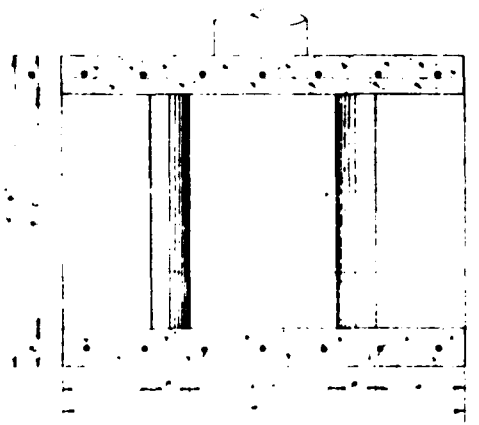
SCALE 1"=10' H & 5' V



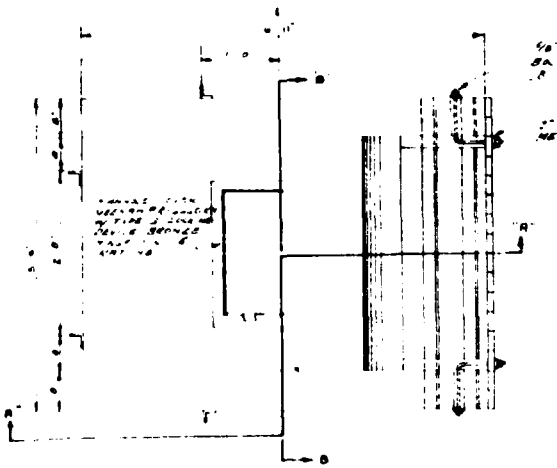
SECTION "A-A"



SECTION "B-B"



SECTION C C



DROP INLET PLAN

GENERAL NOTES

1. CHAMFER ALL EXPOSED CORNERS
2. ALL FERRIMETAL PARTS SHALL BE HOT-DIPPED GALVANIZED
3. ALL EXPOSED BOLTS SHALL BE CUT FLUSH WITH NUTS AFTER TIGHTENING
4. CONCRETE SHALL BE 3000 PSI

APPENDIX F

CORRESPONDENCE

TENNESSEE DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES
4721 TROUSDALE DRIVE, NASHVILLE 37219
615/741-6860

January 21, 1981

Mr. Jimmy Chancellor
Chancellor & Sons Construction Co.
7474 Raleigh LaGrange Road
Cordova, TN 38018

Dear Mr. Chancellor:

As provided by the State Safe Dams Act, Tennessee Code Annotated, Sections 70-2501 to 70-2530, non-federal dams in Tennessee must be inspected and certified for safety by our agency. Presently we are conducting a joint inspection program with the Corps of Engineers under the authority of Public Law 92-367.

According to our records, your dam was built in 1977. As such, according to TCA, Section 70-2505, you should have made application for and received a Certificate of Approval and Safety prior to construction. Our records show that no application was ever received and no Certificate was ever issued.

Please provide this office with all engineering reports, plans, specifications, and construction records produced for the project. If none are available, we will advise you after the inspection as to compliance with the Safe Dams Act.

Tentative plans are to schedule a safety inspection of your dam within the next few months. A staff engineer will be in communication with you shortly to discuss the details of the pending inspection. We have enclosed a copy of the Safe Dams Act and adopted rules and regulations. Please let me know if you have any questions.

Sincerely,

Robert A. Hunt, Director
Division of Water Resources

RAH:lt

Enclosures

ORNED-G

NON-FEDERAL DAM INSPECTION REVIEW BOARD
PO BOX 1070
NASHVILLE, TENNESSEE 37202

Commander, Nashville District
US Army, Corps of Engineers
PO Box 1070
Nashville, TN 37202

1. The Interagency Review Board, appointed by the Commander on 19 June 1981, presents the following recommendations after meeting on 9 July 1981 to consider the Phase I investigation report on Chancellor and Son Dam inspected by the Tennessee Department of Conservation.

2. It should be stated in the report that under the PMF, the dam does overtop slightly.

3. The recommendations should state that the spillways should be both redesigned and rebuilt.

4. The recommendations should emphasize that the erosion on the embankment should be held in check.

5. The Board is in agreement with other report conclusions and recommendations following minor revisions.

HERMAN GRAY
Chief, Design Branch
Alternate Chairman

JAMES SIMS
Design Engineer
Alternate, Soil Conservation Service

ROBERT A. HUNT
Director, Division of Water Resources
State of Tennessee

THOMAS N. PORTER
Hydraulic Engineer
Alternate, Hydrology and Hydraulics Branch

L. E. LOCKETT
Structural Ergineer
Alternate, Design Branch

TIMOTHY MCCHESKEY
Chief, Instrumentation and Inspection Section
Alternate, Geotechnical Branch

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202

21 JUL 1981

IN REPLY REFER TO

ORNED-G

Honorable Lamar Alexander
Governor of Tennessee
Nashville, TN 37219

Dear Governor Alexander:

Please be informed of the results of an inspection, under authority of Public Law 92-367, conducted on Chancellor and Son Dam in Hardeman County, Tennessee. An inspection team, composed of personnel from your Division of Water Resources, observed conditions which indicate a high potential for failure of the embankment dam due to seriously inadequate spillway capacity and other serious deficiencies.

Chancellor and Son Dam is classified as a high hazard potential, small-size dam and, as such, should be able to regulate a one-half probable maximum flood (1/2 PMF) to conform to inspection program guidelines. A hydraulic analysis of the project's spillway showed the dam would be substantially overtopped by a one-half probable maximum flood. A visual inspection indicated that the stability of the embankment is questionable due to seepage on the embankment and at the toe of the dam.

Based on the results of the visual inspection and due to the seriously inadequate spillway capacity, the dam is considered unsafe. While I do not view this as an emergency at this time, I recommend you initiate prompt action by the State to cause the owner to correct the deficiencies as soon as practical to minimize the risk to the house trailers located downstream.

A report of the technical investigation will be furnished your office upon completion.

Sincerely,

Kenneth W. Cuddy, LTC, Deputy Commander
FOR LEE W. TUCKER
Colonel, Corps of Engineers
Commander

CF:
Mr. Robert A. Hunt, Director
Division of Water Resources
4721 Trousdale Drive
Nashville, TN 37220

END

DATE
FILMED

1-82

DTIC